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CHEMISTRY IN THE SERVICE OF MAN

By
JULIUS STIEGLITZ

THE UNIVERSITY OF CHICAGO
December, 1924

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by
JULIUS STRECHT

THE UNIVERSITY OF CHICAGO
Des Moines, Iowa

CHEMISTRY IN THE SERVICE OF MAN¹

BY JULIUS STIEGLITZ

Professor and Chairman of the Department of Chemistry

Mr. President, Colleagues, and Friends:

All of the sciences are performing for man the great service of extending the boundaries of his exact knowledge of his environment, and of enlarging thereby his power to improve the circumstances of his life. In attempting to portray for you today in a single short address the share of chemistry in the service of man, I shall emphasize in particular the possibilities of future service. To this end I shall not only outline for you some of the signal services already rendered, as an earnest of future achievement, but above all, I should like to leave with you the conviction that the fundamental methods and objectives of the pure science of chemistry

¹ Delivered at the One Hundred Thirty-fifth Convocation of the University, held in Leon Mandel Assembly Hall, December 23, 1924.

carry in themselves the certain promise of ultimate success when these methods are applied to an extraordinary variety of problems of the most vital and intimate concern to man.

When almost exactly thirty years ago, on January 2, 1894, the Kent Chemical Laboratory was dedicated as the first of the new buildings of the University of Chicago, except Cobb Hall and three or four dormitories, one of our prominent colleagues of the Faculty of Arts and Literature was overheard to remark that he could not understand how chemistry ever could require a whole building for itself in order to teach *the art of making pills!* I am quoting almost literally this never to be forgotten comment of a highly educated gentleman of the year 1894, because it is a very apt illustration of the remoteness of the understanding of the significance of chemistry, one of the fundamental sciences, even so short a time ago, not only among the people at large, but also among the cultured classes of that day. Unfortunately we have had, until very recently, no Huxley, no Tyndall to interpret us to the public. There is no doubt that it was the Great War which for the first time in the history of mankind brought home to the peoples of the world the awakening to the tremen-

dous power, the almost infinite possibilities inherent in this field of science. Chemistry stood for much that was most evil in the war, but also for much that was of the very best. History has definitely recorded the fact that but for the Haber-Ostwald processes for the fixation of the nitrogen of the air, there would have been no war at all, for without these processes, the store of explosives of the Central Powers, cut off from the nitrate fields of Chile, would have been exhausted in a very few months, and the war would not have been undertaken. But these same nitrogen fixation processes also made the invaluable thousands of tons of nitrates and ammonium salts which fertilized their fields and saved from starvation a hundred million people shut off from their normal importations of food. And today one of the great problems agitating our Congress is the question of exactly how to go about it to bring to our own farmers and our own people the benefits of this new chemical industry which, by the large-scale conversion of the free nitrogen of the air into fertilizers through the aid of cheap, hitherto wasted water power, should help to produce two bushels of wheat or corn where one was raised before. Again, in the war, chemistry prepared every particle of the thousands of tons of high explo-

sives that tore asunder earth and man; it produced the great armaments of steel and supplied the foes on either side with the new dread weapon of surprise, the attack with poison gas; it made possible the sustaining of life in the confined spaces of the submarine and the fighting underseas. But on the other hand, it also supplied thousands of pounds of ether and other merciful pain allaying drugs and disinfectants which helped to reduce the suffering and the loss of life of the wounded to a humanely possible minimum. In our own country, cut off from the customary importation of finer chemicals from abroad, our manufacturers, our hospitals, the government, and finally, the people at large, suddenly awoke to a realization of their utter dependence on chemistry for essentials in industry, essentials in the treatment of disease and alleviation of suffering: The adventurous trips of the submarine "Deutschland" to our shores, loaded with medicaments, dyes, and other precious chemicals—it brought no other commodities—carried a lesson which the thinking, far-seeking men of this country must never forget. And precisely at this, the psychological moment, the University of Chicago in the form of one of its doctors of philosophy at length gave to chemistry its popular interpreter, its Huxley,

its Tyndall—Dr. Edwin E. Slosson. If any of you have not read Slosson's *Creative Chemistry*, get it and read it without fail. Men like Senator Wadsworth of New York have acknowledged that they have sat up almost all night to finish it at one sitting. The great lesson that the war and that Slosson, the interpreter of chemistry to the people, should teach us is the realization of the extraordinary power, the great possibilities *for good* which must reside in the science of chemistry. The power which could do so much widespread harm, the power which already has accomplished so much good, must henceforth be even more intensively exploited with far-seeing wisdom for the good of mankind.

We will realize these possibilities of today and tomorrow the better if we pause for only a moment to ask ourselves what the source is of these great potentialities of chemistry—why this science represents, as it were, an Aladdin's lamp, which with proper rubbing—it usually requires *very hard rubbing*, if you please—will call forth genii with almost unlimited power for good or evil. This may sound like a fairy tale, but it is true, for chemistry is the fundamental science of the transformation of matter, and the transformation of matter almost at will obviously has inherent in it-

self the realization of unlimited possibilities for good. What does the transformation of matter mean to you? Do not think of the futile efforts of the alchemists to transform the baser metals into gold. Even if the recent report is confirmed that mercury may be converted into gold, we must remember that the mercury was not tested to see whether some gold was not present at the outset—even if the cost of conversion should make gold ultimately cheaper than it now is—which is quite unlikely—such a transformation would not compare in value to us with the transformations which are of fundamental importance to each one of us personally. Pasteur, the chemist, in the face of leading biologists of his day, finally proved that even in the lowest organisms, the divine spark of life is not generated spontaneously, but is passed on from generation to generation, and through his discoveries he became the founder of modern scientific medicine. But with this limitation, the continuance of life, from our inception to our last breath, is inseparable from continuous chemical transformations which make possible growth, motion, thought, and the manifold activities of our lives. The cry of the new-born baby is the external signal of the inauguration of a new chemical process necessary for it to

sustain life—the absorption of the oxygen of the air by the blood circulating through its lungs to make possible the many chemical changes essential for its little body. When the chemical changes in our bodies are normal, we are well and happy—when they are abnormal, we are poisoned and sick, and we call in the doctor and he does his best to bring the chemistry of our bodies back to normal. It is not surprising therefore to find that modern medicine and all the other biological sciences are turning more and more to chemistry for aid in the solving of many of their fundamental problems, and presently I will give you some specific illustrations of the achievements already attained by this coalition, an earnest of other great advances of the future. Even the difficult science of psychology, embracing almost all that is dearest to us, facing the great problem of memory, on which all thought, all our intellectual life is based, is confronted with only the two possibilities of records; they are either physical in character, very roughly comparable with phonograph records, or more probably records of a chemical nature such as we have, say in photographs, every process of which from the effect of light on the silver salts of film or plate to the ultimate image of metallic silver deposited in finest gradations is chemical in

character. It is a matter of common knowledge that extraordinary effects are produced on our mental images by drugs, ranging from the benign effects of tea and coffee to the deadly ones of hasheesh and cocaine.

If matters of such intimate concern to us as life, health, and probably thought hark back in large measure ultimately to the fundamental science of the transformation of matter, this is no less true clearly of the great facts of our external lives which we may consider as manifold aspects of industry. Long before the dawn of a science of chemistry, man in his progress upward through chance observations evolved such chemical arts as agriculture, the preparation of metals like bronze and later even steel, the fashioning of bricks, the coloring of his cloths with a few dyes found in Nature. But see what the science of the transformation of matter has accomplished for these early arts: To take only one or two instances, chemistry discovered that in our greatest industry, agriculture, it is the chemical ingredients of the soil and air, mineral salts, potash, lime, and phosphates, nitrogen as ammonia or as nitrate, water and the small amount of carbon dioxide in the air that nourish the seed and growing plant and produce useful cellulose, the sustaining proteins,

starches, and fats which are essential for our life. And hence the agricultural chemists have become practically indispensable to the farmer of today, and botany, as Professor Coulter would gladly agree, has turned like medicine and zoölogy to chemistry for the ultimate solution of some of its most perplexing problems. The steel supporting the walls and roof of this beautiful hall is eloquent of another of the great debts civilization owes to the wizardry of chemistry. It has given to the industries every variety of steel they have needed—ranging from the strong girders supporting our monumental buildings to the finest hair springs of our watches, from the toughened armour of our battleships to the high-speed tools which preserve their cutting edge when red hot. In fact, there is not a single article in this hall, not a single article on our persons that has not been subject to the transforming touch of chemistry—from the aforementioned steel girders of the roof to this very paper, to the glass of these reading glasses. We need enumerate no further: What would the world of today be without modern steel for its structures and machines, without its tons of paper for books and manuscripts, without glass for its optical instruments? In truth, there is not a single industry that does not transform

matter in some fashion or other, and consequently there is not a single industry that does not benefit by the fundamental science of chemistry, that cannot be benefited still more by the application of the knowledge and laws of chemistry to its problems. Modern improvements in the making of steel, paper and better glass amply illustrate this view.

Although this relation of chemistry to industry has been demonstrated again and again in concrete instances, yet there is no doubt that a great veil of mystery seems to surround most of its conspicuous achievements; men see only the beginnings in crude materials, be they ores or coal tar, and the ends attained in the finished products, whether they are alloys of the most valuable character, dyes, or medicaments. They do not understand the steps leading from the crude product to the finished article. If we turn now to consider rather the fundamental methods of the pure science of chemistry than products, much of the mystery will be removed.

Like most of the other sciences, chemistry studies its problems from two points of view—the static side which is concerned with the composition of matter—and the dynamic side which deals with the laws control-

ling the changes of matter. Each method of approach to its problems is invaluable, and naturally, chemistry relies on both to accomplish its purposes.

In his static studies, the chemist *analyzes* all things that come under his ken, that is, he takes everything apart and examines minutely not only the nature of every single component, but also the way in which the individual components are joined together. He carries out this process with everything under the sun and in fact, even everything beyond the sun also, with the aid of the spectroscope invented jointly by the physicist, Kirchhoff, and the chemist, Bunsen. No particle in the earth's crust, no ingredient of the countless invaluable components of our own bodies which make life possible, escapes this ardent spirit of analyzing research by the inspired chemist. It is in part because the mere bulk of this work is so far beyond the powers of the chemists of two or three generations, that the future holds out such great possibilities for medicine and industry. For through analysis, chemistry has already achieved many great results. In its simplest form, by assay, it tells the miner whether his ores of iron, gold, silver, copper, and innumerable other valuable ingredients of the

earth's crust are worthy of industrial exploitation. Through analysis chemists found in common clay a silver white metal, aluminum, lighter than iron, and by persistent effort they found out how to separate this metal on a commercial scale through cheap electric power, and thus gave to man one more metal, valuable for its lightness and its strength in alloys, which will probably form the very body of the great transatlantic carriers of the future, the Zeppelins.

From the ancient art of baking bricks, has grown largely with the aid of careful analysis, the great modern industry of portland cement and other artificial stones.

Becquerel in Paris observed unexpected radiant effects of a rare element, uranium; and Mme. and M. Curie in a wonderful feat of analysis separated from tons of the uranium containing ore, pitch-blende, a minute quantity of a new element, and gave the world radium.

There are many other rare elements which the constant search of the chemist has uncovered and which are proving of the greatest value to man: Cerium and thorium, increasing twenty fold the illumination from his gas flame; pure tungsten for his electric light bulbs; selenium, for pho-

tography by telegraph or by wireless. We are only at the beginning of an era of exploitation of the rarer products of the earth's crust thus revealed to man.

By this same prying method of analysis, chemists separated from the old crude drugs cinchona bark, opium, nux vomica, belladonna, the pure principles quinine, morphine, strychnine, atropine, achievements which among other benefits put into the hands of physicians the possibility of hypodermic injections for almost instantaneous relief when seconds mean life or death. Most impressive is a very recent great triumph: The methods of chemistry served a Banting to separate from the glands of the pancreas that precious secretion, insulin, the sugar consuming principle which already is saving thousands of lives in the treatment of diabetes, and which is esteemed by some as the greatest single achievement in medicine given to mankind since the days of Pasteur and of Behrens, the discoverer of diphtheria antitoxin. Every step in the preparation and preservation of insulin is controlled by the science of chemistry. Before Banting, Kendall of the Mayo Foundation had isolated thyroxin, an active principle of the thyroid gland, which helps to regulate the metabolism of the body—a

principle so active that an occasional dose no larger than a grain of salt is able to cure cretinism, a condition of stunted growth of body and mind, and myxedema, a similar condition developing in adults. Still earlier, the pioneer in this field, Abel, at Johns Hopkins University, isolated epinephrine or adrenalin from the suprarenal glands, an invaluable addition to the resources of modern medicine, of which it has even been occasionally reported that injected into the heart of a still-born infant or of a patient dying on the operating table, it has restored the pulsation of the heart and given the physician those precious few more moments by means of which he may save life.

Surely these achievements, momentous as they have been, are but a promise of the many further blessings that man must anticipate from the continued application of this method of attack of pure chemistry on the problems of life! For there are other powerful internal secretions the isolation of which will aid the physician in regulating the chemistry of the body, in sustaining our working powers, in correcting the accidents of mischance, exhaustion, or disease. Our antitoxins for diphtheria, typhoid, pneumonia, etc. resemble the crude drugs of old in carrying with

minute quantities of pure, live-preserving principles large amounts of inert, often harmful, ingredients. Every doctor is handicapped by the possibilities of serious secondary effects, by the limits set by these impurities. It is to chemistry that we must look for the isolation of these pure principles from these crude biological products obtained from the blood of the horse, the hog or the hen. The pity of the situation lies in the fleeting years which elapse and the lives which are lost, the suffering which is borne, because the workers in this field are not multiplied for more intensive effort as the men are gathered into armies not for the saving of life, but for its destruction!

Moreover, the analytical quest of the chemist is not satisfied with the isolation of pure principles. He proceeds to take the smallest particles of these principles, their molecules, apart, atom by atom and does not rest until he knows exactly how each atom is linked to the other—the way an architect would examine the structure of this beautiful hall. The more exact his knowledge, the greater is man's power, and it is not surprising that this profound analysis of the atomic structure of important principles has extended the power of chemistry enormously. For, if like the small

boy taking his first watch apart, a chemist takes his molecules apart, the chemist, unlike the small boy, does not stop until he has succeeded in putting the parts together again, in reconstructing his principle. This *synthetic* or *creative* process based on deep-reaching analysis has already proved of greatest benefit to man. In the first place, it has given us the power to produce cheaply and in any desired quantity rare and valuable natural products. Thus, even so ephemeral but lovely a thing as the perfume of the violet has been captured and made available for the enjoyment of the many thousands instead of a privileged few. In the second place, man learning these innermost secrets of Nature has had the genius to push ahead and to invent products far better than any Nature in her blind way has given him. Recall what vast improvements have grown out of an intimate knowledge of earlier, less excellent inventions in the case of the steam engine, the internal combustion engine, the telephone, and other great inventions!

Time permits of only two or three illustrations of this service of creative chemistry taken from the fields of industry and medicine.

Baeyer, of the University of Munich, the greatest organic chemist of

his age, worked fourteen years, from 1867 to 1881, on the structure of the molecule of indigo, and thus laid the foundation for a great new industry, the production of indigo in thousands of pounds from cheap coal tar in purer form, of a purer shade, than vegetation had ever given to man, and the lands in India used for the production of indigo have been released for the raising of other much needed crops. The whole dye industry rests on a similar basis of ultimate analysis and synthetic creative effort—supplying us with dyes of every conceivable shade of color, dyes which will resist the wash ladies' most destructive efforts, dyes which are so sensitive that they sensitize photographic plates to an astonishing degree, even dyes which give our ladies two different colors in one piece of fluorescent silk. This complete triumph of industry in the field of dye-production must ultimately be overshadowed by even more important creative triumphs in the more difficult field of medicine. As an instance, we have the case of the familiar drug cocaine. It was hailed as an invaluable addition to the surgeon's armament when it was shown that a solution of cocaine brought on mucous membrane or injected under the skin had the peculiar property of deadening the sensation of pain to the sur-

geon's knife. But this precious local anesthetic has certain great drawbacks—it is very poisonous and very expensive, and worst of all, it is, as you know, a habit-forming drug of the most pernicious type. The inquiry into the structure of the molecule of cocaine was a very difficult one, but once accomplished, chemists invented and gave to the medical profession a series of artificial local anesthetics, such as procaine or novocaine, which are less poisonous, cheaper, and above all, which have not the slightest trace of habit-forming properties.

Success in improving upon natural products, the triumphs of the dye industry, finally emboldened man to use the resources of chemistry to strike out for himself independently of natural principles, to create for medicine preparations wholly new, and to apply more freely to medicine preparations long known to the chemist only. Of untold value has been Ehrlich's invention of salvarsan or "606," with the object of destroying in the human system by a specific poison the invading germ of syphilis with a minimum of harm to the tissues of the body. With its aid, mankind is now freeing itself of this scourge, counting too many millions of sufferers, literally ten million in this country alone, as the army records showed.

Similarly, medicine is engaged in a truly blessed and successful chemical warfare on the disease of hookworm, counting many other millions of poor sufferers; on leprosy, and other widespread diseases. You must realize with what heartened ardor chemistry and medicine are pursuing this path toward the invention of specific remedies against the deadly scourges of pneumonia and tuberculosis and similar diseases. How many in this audience must bid all speed to these workers in the great cause of mankind, praying that the period of waiting be not too long, that the certain result come not too late to be of benefit to those near and dear to them. Again, let us heed in this the great lesson of the war, in chemistry as in industry—a *massive concentration* on a problem is the only certain means of hastening its accomplishment.

The inquiring analytical method of chemistry has in recent years, as you know, gone much farther even than the study of the arrangements of atoms in molecular structure. Hand in hand with their brother physicists, chemists have advanced to the study of the structure of the atom itself, and even to the effort of the breaking up of atoms. Sir Ernest Rutherford, who received the Nobel Prize in chemistry, has gone farthest in this last

direction—and on a minute scale has destroyed the atoms of some dozen or more elements, and thereby transformed these elements into other elements. Professor Harkins in Kent is attempting similar minute scale operations. The atoms of some elements, especially of radium, decompose spontaneously, and in doing so, release a great deal of energy. Thus, the energy released by the decomposition of the atoms in a single gram of radium—say a half a teaspoonful—is the equivalent of the heat of combustion of half a *ton* of the best hard coal! But, aside from the great rarity and value of radium, the rate of its decomposition is so slow that it would take some thousands of years to secure this energy. If we could artificially inaugurate and accelerate the decomposition of the atoms of more common elements, we would have a supply of energy at hand which would relieve man of all his worries about the exhaustion of his oil and coal supplies. When anthracite was first discovered, it was discarded as worthless because it would not burn—at least so it seemed; but man learned to burn it by using first the heat of other fuel to start the anthracite fire in a sufficiently strong draft of air, and then by using some of the heat of the anthracite itself to keep the fires going—and now, of

course, anthracite is one of our most precious fuels. Man could well afford to spend quite a large amount of energy to start the decomposition of atoms and to release their internal energy, and then use part of the released energy to continue the process once we have discovered how to do it, if it is proved that the energy released is greater than that consumed in the process.

Time permits only a very condensed consideration of the great opportunities offered man by the second great method of attack used by pure chemistry in its problems—the study of the dynamic laws controlling and limiting all transformations of matter. These laws are fundamental, like the law of gravitation, and of fascinating interest. But I must limit myself to giving you only two or three brief illustrations of their application to problems of moment to man at large.

The elaboration of the Haber process for the fixation of the nitrogen of the air, which means so much for the fertilization of our fields, would not have been possible if Dr. Haber had not applied the laws of the dynamics of chemical action to the problem before undertaking the experimental elaboration itself. Nitrogen and hydrogen, the components to be

combined, are gases—very dilute forms of matter—and they are also very inert, resisting combination. Haber calculated the optimum conditions for bringing about their union, the optimum conditions of temperature and of increased concentration by pressure on the gases. The results demanded apparatus of hitherto unheard of strength applied on an industrial scale—for highly compressed gases at a high temperature have a truly terrific power of expansion. The work was undertaken, the apparatus supplied, and the process proved successful with all it means now in the service of man.

The contact process of manufacturing sulphuric acid, one of the fundamental gross chemical industries, was developed in the same way, doing away with the need of costly lead houses of enormous capacity. During the war, the demand for acetylene for the manufacture of alcohol, acetic acid, acetone, and other chemicals grew to extraordinary proportions. One of our own Kent Ph.D.'s, Dr. Curme, working at the Mellon Institute for Industrial Research, was given the problem of making acetylene from carbon and hydrogen directly. Like Haber, before a cent was spent on experimentation, Curme calculated the maximum yield to be expected

under optimum conditions of temperature and pressure. He found a 24 per cent yield was the best to be expected; the experimental work that followed produced a yield of 23.9 per cent—and a new industry was founded at a minimum cost of experimentation.

During the war, too, many industries that could not meet the demands made upon them, and could not afford to wait for enlarging their equipment, found that by applying the laws of chemical action to their production, they could cut down a twelve-hour period for their pressure tanks to eight hours, and thus run through three batches in a twenty-four-hour day in place of two, a 50 per cent increase in output.

This dynamic side of chemistry is being applied with great success in recent years to problems of medicine; it is of interest to note that the very first course offered by Dr. McLean, the professor of medicine in our new medical school, had as its topic the application of physical chemistry to medicine. One specific illustration must suffice: Dr. Howland, of Johns Hopkins University, and his collaborators with its aid have given us at last a convincing explanation of bone-formation in our bodies and have demonstrated the ultimate causes of the lack of bone-formation in the disease

known as rickets. This widespread disease, as a result of this work and of other recent discoveries primarily of a chemical nature, is certain to disappear now from the face of the earth—a blessing, indeed, to tens of thousands of little ones.

We thus find the real sources of the great potentialities of chemistry, the science of the transformation of matter, in its penetrating powers of analysis reaching down to and beyond the ultimate atoms of matter, in its power of creation by the assembling of these ultimate particles into new combinations dictated by the genius of man, and in its intimate knowledge of the laws governing the activities of these ultimate particles of matter. But let us recall that the pure science of chemistry itself is far removed from having attained its full growth; as evidence of this, when Kent Chemical Laboratory was constructed, only yesterday as it seems to some of us, physical chemistry was an infant of a very few years known to but a few, and no provision was made for it in Kent—today it is a giant and is doing a giant's work as evidenced by the Haber process, by Howland's work on rickets, and other achievements. The modern exact science of colloidal chemistry was scarcely born—and our very bodies and their every organ other than the bones are colloids. The discovery of radium,

of the decomposition of elements, the knowledge of the electrical structure of matter came to us several years later. In the face of this experience of the growth of the pure science of chemistry, we must anticipate further developments of the greatest importance. It is beyond question that to solve some of the momentous problems of medicine and life, the science of chemistry itself must advance to new knowledge, uncover new principles. It has been ever thus in the progress of science as of man—we grow in power in proportion to the difficulty of the undertakings we enter upon.

Hence, if chemistry even today has created for the service of man the most powerful machine that has ever been within his grasp for corrective and creative effort in the fields of industry and medicine, so vital for everyone of us, let us frankly recognize that even more penetrating knowledge of the composition and the laws of matter must be developed by our science, if it is to do its utmost for mankind. May its service be essentially for good and not for evil, for great as are its achievements of the past, we believe that the world is only now at the threshold of its promise of today and the future through the now universal recognition of its significance, of its possibilities in the protection and enrichment of life.

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of matter came to us several years later. In the face of this experience
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grow in power in proportion to the breadth of the knowledge we attain.
Hence, if humanity ever today has entered for the service of man the
newest scientific machine that has ever been within his grasp for constructive
and creative effort in the fields of industry and medicine, so vital for
everything of us, let us finally recognize that even more penetrating
knowledge of the composition and the laws of matter must be developed
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The University of Chicago

Office of the Counsel and Business Manager

ROOM 1204, 134 SOUTH LASALLE ST.
TELEPHONE FRANKLIN 214

October Twenty Seven
1 9 2 1

President Harry Pratt Judson,
The University of Chicago.

My dear President:

The settlement of the case of Miss Terry
under the Workmen's Compensation statute will in-
volve the following:

For loss of eye	\$1200.00
For loss of time, 9 weeks at \$12 a wk.	108.00
Hospital and medical fees, exclusive of artificial eye, said to be	<u>1100.00</u>
Total	\$2408.00

Very truly yours,

WH:MB

Marion Becker

Chemistry

Very truly yours,

\$2408.00

1100.00

Hospital and medical fees, exclusive
of artificial eye, said to be

two years of time, 2 weeks at \$18 a wk. 108.00

\$1200.00

For loss of eye

Under the workmen's compensation statute will in-

volve the following:
The settlement of the case of Miss Terry

My dear President:

The University of Chicago.

President Harry Pratt Judson,

October Twenty Seven
1 2 1

The University of Chicago
Office of the President, University of Chicago

December 6, 1921

Mr. Geo. Fairweather
Downtown Office

Dear Mr. Fairweather:

Miss Terry has finally decided that she would like to ask that Mr. Heckman and the Trustees drop altogether the matter of remuneration of any kind for her expenses incidental to her accident. She feels strongly that she has no legal claim and does not wish to recognize a moral basis for any assistance, particularly as she feels that she is not in need of any such assistance. As she states too that the discussion is emotionally disturbing to her and that such disturbance involves a real risk for the safety of the other eye, she asks ~~that~~ ~~for~~ that nothing further be said or done in the premises. In return she says, "To relieve your anxiety, I promise to ask for help should I need it. That, however, is unlikely." Under the circumstances, I believe we can do nothing else than comply with Miss Terry's wishes in the matter. This is my conclusion after a long, quiet conference with her personally.

I am sending a copy of this letter to President Judson. Thanking you for your interest in the difficulty, I am

Yours sincerely,

Julius Stegely

JS/ML

*Copy for
President Judson.*

December 8, 1931

Mr. Geo. Fairweather
Downtown Office

Dear Mr. Fairweather:

Miss Terry has finally decided that she would like to ask that Mr. Jackson and the Trustees drop altogether the matter of remuneration of any kind for her expenses incidental to her accident. She feels strongly that she has no legal claim and does not wish to recognize a moral basis for any assistance, particularly as she feels that she is not in need of any such assistance. As she states too that the discussion is emotionally disturbing to her and that such disturbance involves a real risk for the safety of the other eye, she asks ~~that~~ nothing further be said or done in the premises. In return she says, "To relieve your anxiety, I promise to ask for help should I need it. That, however, is unlikely." Under the circumstances, I believe we can do nothing else than comply with Miss Terry's wishes in the matter. This is my suggestion after a long, quiet conference with her personally.

I am sending a copy of this letter to President Jackson. Thanking you for your interest in the difficulty, I am

Yours sincerely,

Julius Stegert

js/mc

Copy for President Jackson

The University of Chicago
Department of Chemistry

X +

+ 12

December 6, 1921

President Judson
Faculty Exchange

Dear President Judson:

The copy of a letter to Mr. Fairweather in regard to the case of Miss Terry's accident this summer explains itself. Under the circumstances, I believe it would be best for all to comply strictly with Miss Terry's wishes. I am

Yours sincerely,

Julius Stieglitz

JS/ML

Dr. Julius Stieglitz,
The University of Chicago.

HPJ:CB

The University of Chicago

Department of Geology

December 1, 1931

President Wilson

President Wilson

Geology Department

Dear President Wilson:

The copy of a letter to Dr. H. H. Henshaw in regard to the work of
this group is enclosed. This group is working on the
problem of the origin of the life of the earth, and
I believe it would be well for all the groups working with
this group to know of it.

Very sincerely,

Dr. H. H. Henshaw

Handwritten signature

1931

Very respectfully,
Dr. H. H. Henshaw

cc: Dr. H. H. Henshaw

Dr. H. H. Henshaw

December 8, 1921.

My dear Mr. Stieglitz:-

Your note of the 6th instant
with enclosed copy of your communication
to Mr. Fairweather is received.

Very truly yours,

Dr. Julius Stieglitz,
The University of Chicago.

HPJ:CB

December 8, 1931.

My dear Mr. Stieglitz:-

Your note of the 6th instant

with enclosed copy of your communication

to Mr. Fairweather is received.

Very truly yours,

Dr. Julius Stieglitz,
The University of Chicago.

HPJ:CB

The University of Chicago

The University Laboratories

OFFICE OF THE DIRECTOR

March 2, 1923.

President Ernest D. Burton,

Faculty Exchange.

Dear Mr. Burton:-

As stated to you in our interview yesterday, we have had in the past authorization to negotiate for our Assistants for the following year, in March, at the same time as we make our selections for fellowships. The same group of men is considered for both types of appointment, and if we delay, we are likely to lose the best man.

In view of the uncertainty about the numbers of college students that will be admitted next autumn, I would recommend that we be authorized now to assume that at least two-thirds of the normal appropriation for Assistants will be granted the Department for next year, as a basis for securing men at the present time.

In some of the other Science Departments, selections for Assistants are also likely to be desirable at this time, for the reason indicated above. May I therefore, suggest that a letter be sent by you to all heads of the Science Departments about as follows:

"In view of the legislation that is being considered that may affect our college attendance, there is some uncertainty in regard to the item of appropriations for Assistants for the coming year. As it is highly desirable in some Departments to secure Assistants this month, in connection with the survey of candidates for fellowships, you are hereby authorized to proceed for negotiations for Assistants on the assumption that at least two thirds of the normal appropriations for Assistants will be made. This does not mean that there will be a reduction of one-third--it merely means that time is desired to study the situation from all sides. This will include the possible need of securing better Assistants, in order to raise the standards of instruction.

Since the summer quarter brings to Departments, men eligible for Assistants, and some Departments in fact, purposely delay selecting a part of their staff of Assistants, in order to be free to hold good men appearing in the summer, it is thought that the above plan will safeguard the interests of Departments, and will meet with your approval."

I think I have covered the situation.

Yours sincerely,

Julius Strept

JS:ER

was
Burton
Fellow
with
letter-

March 10 - 1923

March 2, 1932.

OFFICE OF THE DIRECTOR

President Ernest D. Burton,

Faculty Exchange.

Dear Mr. Burton:-

As stated to you in our interview yesterday, we have had in the past authorization to negotiate for our Assistants for the following year, at the same time as we make our selection for fellowships. The same group of men is considered for both types of appointment, and if we delay, we are likely to lose the best men.

In view of the uncertainty about the numbers of college students that will be admitted next autumn, I would recommend that we be authorized now to assume that at least two-thirds of the normal appropriation for Assistants will be granted the Department for next year, as a basis for our work at the present time.

In view of the other Science Departments, selection for Assistants are also likely to be desirable at this time, for the reasons indicated above. I therefore suggest that a letter be sent by you to all heads of the Science Departments about as follows:

"In view of the legislation that is being considered that may affect our college attendance, there is some uncertainty in regard to the time of appropriation for Assistants for the coming year. As it is highly desirable in some Departments to secure Assistants this month, in connection with the survey of candidates for fellowships, you are hereby authorized to proceed for negotiation for Assistants on the assumption that at least two-thirds of the normal appropriation for Assistants will be made. This does not mean that there will be a reduction of one-third--it merely means that time is desired to study the situation from all sides. This will insure the possible need of securing better Assistants, in order to raise the standards of instruction.

Since the summer quarter brings to Department, men eligible for Assistants, and some Departments in fact, purposely delay selecting a part of their staff of Assistants, in order to be free to hold good men appearing in the summer, it is thought that the above plan will safeguard the interests of Departments, and will meet with your approval."

I think I have covered the situation.

Yours sincerely,

13:28

The University of Chicago

CHICAGO, ILLINOIS

Office of the President

March 10, 1923.

sent to Mr. Suggs

In view of the legislation that is being considered that may affect our college attendance, there is some uncertainty in regard to the item of appropriations for assistants for the coming year. As it is highly desirable in some Departments to secure Assistants this month, in connection with the survey of candidates for fellowships, you are hereby authorized to proceed for negotiations for Assistants on the assumption that at least two thirds of the normal appropriations for Assistants will be made. This does not mean that there will be a reduction of one-third. It merely means that time is desired to study the situation from all sides. This will include the possible need of securing better Assistants, in order to raise the standards of instruction.

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Very truly yours,

Ernest C. Burton

XX

The University of Chicago

Department of Chemistry

August 8, 1923

President E. D. Burton
Faculty Exchange

Dear President Burton:

Our first-class mechanics have had the privilege of inventing apparatus of their own on which they have taken out patents, and of working outside of their regular hours on consulting work and the making of special apparatus for parties outside of their specific departments. Without this privilege it would be impossible for us to hold first-class men on the basis of our University salaries. They are not allowed to use the University name in any way or the University address, and they are not allowed to manufacture wholesale on our premises. Now, however, the request has been made by Mr. Hanson, our chief mechanic, and Mr. Reppert, the University glassblower, whether they might use on a card containing their names the telephone Midway 0800, Local 119, not using in any way the University name.

This is a privilege which can be granted only with your permission. Personally, I can see no harm resulting to the University, and as during the day the men can only be reached by this telephone it seems rather fair to give them this privilege. I think I would recommend that the privilege be granted subject to cancellation if we find that it does not work well. Perhaps I should add that they have invented a new and very simple air-pump for very low pressures which is highly appreciated by the research men both in chemistry and in physics, and it is in connection with the wider use of this pump that they are proposing to issue a card. Of course it is to the advantage of the University that such inventions should be made here.

Yours sincerely

James Steyer

JS F

The University of Chicago

Department of Chemistry

August 6, 1933

President E. D. Burton

Faculty Building

Dear President Burton:

Our first class and second class have the privilege of having students of their own choice who have taken our course, and of working outside of their regular hours on consulting work and the making of special apparatus for parties outside of their special department. Without this privilege it would be impossible for us to hold first class men on the basis of our University salaries. They are not allowed to use the University name in any way or for the University's advantage, and they are not allowed to associate with outside on our premises. Now, however, the request has been made by Mr. Burton, our only academic and not a faculty member, the University administrator, that they might use a card containing their names as telephone numbers, and that they might use the University name.

This is a privilege which can be granted only with your permission. Personally, I am not in favor of this privilege, and as during the day the men can only be reached by this telephone it seems rather fair to give them this privilege. I think I would recommend that the privilege be granted subject to cancellation if we find that it does not work well. Perhaps I should add that they are not to be used for any other purpose than the one for which they are granted, and that they are to be used in connection with the work of the department, and it is in connection with the work of this group that they are proposed to issue a card. Of course it is to the advantage of the University that such functions should be made less.

Yours sincerely

Henry S. Gantt

+

XV

223894

The University of Chicago
Office of the Counsel and Business Manager

ROOM 1838, 230 SOUTH CLARK ST.
TELEPHONE DEARBORN 9312

September Five
1 9 2 3

President Ernest D. Burton,
The University of Chicago.

My dear President:

Dr. Stieglitz' request being apparently a deviation from the recognized policy of the Board, I thought best to submit the matter to Mr. Swift for his suggestion. I am sending with this a copy of his reply, together with Dr. Stieglitz' letter to you.

It is necessary to the best operation of the department to secure first-class mechanics, as Dr. Stieglitz states. Mr. Swift seems to recognize that fact. I do not see that his suggestion would interfere with the legitimate operation of the transaction of the business of the mechanic. He would then be on his own time.

I should dislike to lose the men, however, by the imposition of the condition; and, personally would feel like leaving it to the discretion of Dr. Stieglitz, who is keenly alive to the interests of the University.

Very truly yours,

WH:EB
Enc.

Walter H. H. H.

The University of Chicago
Office of the President and Academic Council

September Five
1932

President Ernest B. Burton,
The University of Chicago.

My dear President:

Dr. Stieglitz' request being apparently
a deviation from the recognized policy of the Board,
I thought best to submit the matter to Mr. Swift
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by the imposition of the condition; and, personally
would feel like leaving it to the discretion of
Dr. Stieglitz, who is keenly alive to the interests
of the University.

Very truly yours,

W.H.B.
Enc.

-copy-

September 5,
1 9 2 3

Mr. Wallace Heckman,
230 S. Clark St.,
Chicago.

Dear Mr. Heckman:

Referring to Dr. Stieglitz and
Dr. Burton's queries attached:

My own feeling is that the
proposition of trying to do business over the tele-
phone in this fashion will not be successful and
think we should avoid it if possible.

Would it not be practical to suggest one of the two
alternatives: (1) that the residence telephone
number be used with the understanding that the
person answering may give the University number
if unable to handle the inquiry, or (2) that the
residence telephone number be used with the
statement "after 6 P.M."

As I see the situation, would not
refuse it but would try to work out a more agreeable
alternative.

Yours truly,

(Signed) Harold H. Swift.

-copy-

September 3,
1933

Mr. Wallace Heckman,
230 S. Clark St.,
Chicago.

Dear Mr. Heckman:

Referring to Dr. Steglitz and

Dr. Burton's queries attached:

My own feeling is that the

proposition of trying to do business over the tele-

phone in this fashion will not be successful and

think we should avoid it if possible.

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if unable to handle the inquiry, or (2) that the

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refuse it but would try to work out a more agreeable

alternative.

Yours truly,

(Signed) Harold H. Swift.

CLASS OF SERVICE DESIRED	
Telegram	
Day Letter	
Night Message	
Night Letter	

Patrons should mark an X opposite the class of service desired: OTHERWISE THE MESSAGE WILL BE TRANSMITTED AS A FULL-RATE TELEGRAM

WESTERN UNION TELEGRAM

NEWCOMB CARLTON, PRESIDENT

GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT

Receiver's No.
Check
Time Filled

Send the following message, subject to the terms on back hereof, which are hereby agreed to

To

Professor W.D. Harkins

Street and No. (or Telephone Number)

Kent Chemical Laboratory

Place

University of Chicago
Chicago Ill

19 23

Congratulate you heartily on your important discoveries announced in Chicago Sunday Tribune and on front page of New York Times today. Such results of research are of inestimable value and reflect great honor on you and the University.

Ernest O. Burton

SENDER'S ADDRESS
FOR ANSWER

Room 1240

SENDER'S TELEPHONE NUMBER

ALL MESSAGES TAKEN BY THIS COMPANY ARE SUBJECT TO THE FOLLOWING TERMS:

To guard against mistakes or delays, the sender of a message should order it repeated, that is, telegraphed back to the originating office for comparison. For this, one-half the unrepeatable message rate is charged in addition. Unless otherwise indicated on its face, this is an unrepeatable message and paid for as such, in consideration whereof it is agreed between the sender of the message and this company as follows:

1. The company shall not be liable for mistakes or delays in the transmission or delivery, or for non-delivery, of any message received for transmission at the unrepeatable message rate beyond the sum of five hundred dollars; nor for mistakes or delays in the transmission or delivery, or for non-delivery, of any message received for transmission at the repeatable message rate beyond the sum of five thousand dollars, *unless specially valued*; nor in any case for delays arising from unavoidable interruption in the working of its lines; nor for errors in cipher or obscure messages.
2. In any event the company shall not be liable for damages for mistakes or delays in the transmission or delivery, or for the non-delivery, of any message, whether caused by the negligence of its servants or otherwise, beyond the sum of five thousand dollars, at which amount each message is deemed to be valued, unless a greater value is stated in writing by the sender thereof at the time the message is tendered for transmission, and unless the repeatable message rate is paid or agreed to be paid, and an additional charge equal to one-tenth of one per cent of the amount by which such valuation shall exceed five thousand dollars.
3. The company is hereby made the agent of the sender, without liability, to forward this message over the lines of any other company when necessary to reach its destination.
4. Messages will be delivered free within one-half mile of the company's office in towns of 5,000 population or less, and within one mile of such office in other cities or towns. Beyond these limits the company does not undertake to make delivery, but will, without liability, at the sender's request, as his agent and at his expense, endeavor to contract for him for such delivery at a reasonable price.
5. No responsibility attaches to this company concerning messages until the same are accepted at one of its transmitting offices; and if a message is sent to such office by one of the company's messengers, he acts for that purpose as the agent of the sender.
6. The company will not be liable for damages or statutory penalties in any case where the claim is not presented in writing within sixty days after the message is filed with the company for transmission.
7. It is agreed that in any action by the company to recover the tolls for any message or messages the prompt and correct transmission and delivery thereof shall be presumed, subject to rebuttal by competent evidence.
8. Special terms governing the transmission of messages under the classes of messages enumerated below shall apply to messages in each of such respective classes in addition to all the foregoing terms.
9. No employee of the company is authorized to vary the foregoing.

THE WESTERN UNION TELEGRAPH COMPANY
INCORPORATED
NEWCOMB CARLTON, PRESIDENT

CLASSES OF SERVICE

TELEGRAMS

A full-rate expedited service.

NIGHT MESSAGES

Accepted up to 2:00 A.M. at reduced rates to be sent during the night and delivered not earlier than the morning of the ensuing business day.

Night Messages may at the option of the Telegraph Company be mailed at destination to the addressees, and the Company shall be deemed to have discharged its obligation in such cases with respect to delivery by mailing such Night Messages at destination, postage prepaid.

DAY LETTERS

A deferred day service at rates lower than the standard telegram rates as follows: One and one-half times the standard Night Letter rate for the transmission of 50 words or less and one-fifth of the initial rates for each additional 10 words or less.

SPECIAL TERMS APPLYING TO DAY LETTERS:

In further consideration of the reduced rate for this special Day Letter service, the following special terms in addition to those enumerated above are hereby agreed to:

- a. Day Letters may be forwarded by the Telegraph Company as a deferred service and the transmission and delivery of such Day Letters is, in all respects, subordinate to the priority of transmission and delivery of regular telegrams.
- b. Day Letters shall be written in plain English. Code language is not permissible.
- c. This Day Letter is received subject to the express understand-

ing and agreement that the Company does not undertake that a Day Letter shall be delivered on the day of its date absolutely, and at all events; but that the Company's obligation in this respect is subject to the condition that there shall remain sufficient time for the transmission and delivery of such Day Letter on the day of its date during regular office hours, subject to the priority of the transmission of regular telegrams under the conditions named above.

No employee of the Company is authorized to vary the foregoing.

NIGHT LETTERS

Accepted up to 2:00 A.M. for delivery on the morning of the ensuing business day, at rates still lower than standard night message rates, as follows: The standard telegram rate for 10 words shall be charged for the transmission of 50 words or less, and one-fifth of such standard telegram rate for 10 words shall be charged for each additional 10 words or less.

SPECIAL TERMS APPLYING TO NIGHT LETTERS:

In further consideration of the reduced rates for this special Night Letter service, the following special terms in addition to those enumerated above are hereby agreed to:

- a. Night Letters may at the option of the Telegraph Company be mailed at destination to the addressees, and the Company shall be deemed to have discharged its obligation in such cases with respect to delivery by mailing such Night Letters at destination, postage prepaid.
- b. Night Letters shall be written in plain English. Code language is not permissible.

No employee of the Company is authorized to vary the foregoing.

September 8, 1923.

My dear Dr. Stieglitz:

I am handing you herewith your letter of August 8th and the comments of Mr. Swift and Mr. Heckman upon the matter. When you have read them I shall be glad to have you make further recommendation and return the entire correspondence to me for my files. I am sure you will recognize the desire of both Mr. Swift and Mr. Heckman to meet your wishes in the matter as far as practicable.

Very truly yours,

Dr. J. Stieglitz,
The University of Chicago.

EDB:CB

September 8, 1923.

My dear Dr. Stieglitz:

I am handing you herewith your

letter of August 8th and the comments
of Mr. Swift and Mr. Heckman upon the mat-
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glad to have you make further recommendation
and return the entire correspondence to me
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to meet your wishes in the matter as far as
practicable.

Very truly yours,

Dr. J. Stieglitz,
The University of Chicago.

RDB:CB

XX

The University of Chicago

Department of Chemistry

223936

September 14, 1923.

President Burton,
Faculty Exchange.

Dear President Burton:

I have your note of September 8th, with the correspondence from Mr. Swift and Mr. Heckman in regard to the question raised by our mechanic Mr. Hanson, and our gas blower Mr. Reppert.

I would recommend that Mr. Swift's ^{first} suggestion be made the basis of your decision, namely "that the residence telephone be used with the understanding that the person answering may give the University number if unable to handle the inquiry." I hope that this will be considered tentative to the extent that if it is found not to work well, I may bring up the question again for further consideration.

I have in mind in particular the fact that we have developed here in Kent a spirit of loyalty to the University in our service people, and that Mr. Hanson in particular has made the interests of the University his own. He is commonly in Kent by 7:30 A. M. in order to see that everything is in good shape, and he very commonly comes to Kent from his home in Englewood on Sundays to see that the building is in good condition. He works over-time without extra charge, and has not been taking the full time of allowed vacation. I should dislike very much to injure in any way this spirit of devotion, and feel that the University as a general policy should meet its service people in the same spirit of caring for their legitimate private interests.

The University has done this in the past in many actions of the Board of Trustees, and it is in this spirit that I would interpret the recommendation of Mr. Swift.

Yours sincerely,

JS:F

Julius Stieglitz

XX
The University of Chicago
Department of Geology

503936

September 14, 1933

President Burton,
Faculty Exchange.

Dear President Burton:

I have your note of September 8th, with the correspondence from Mr. Swift and Mr. Heckman in regard to the question raised by our mechanic Mr. Hanson, and our answer Mr. Rapoport.

I would recommend that Mr. Swift's suggestion be made the basis of your decision, namely "that the telephone telephone be used with the understanding that the person answering may give the University number if unable to handle the inquiry." I hope that this will be considered tentative to the extent that if it is found not to work well, I may bring up the question again for further consideration.

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Yours sincerely,

1517

XX

October 29, 1923.

My dear Mr. Tufts:

When you can find leisure
I should be glad if you would make some
study of the Department of Chemistry
with a view to discovering whether Mr.
Gale's criticisms of it are justified.

Very truly yours,

Mr. J. H. Tufts,
The University of Chicago.

EDB:CB

XX
October 29, 1923.

My dear Mr. Tates:

When you can find leisure

I should be glad if you would make some

study of the Department of Chemistry

with a view to discovering whether Mr.

Gale's criticisms of it are justified.

Very truly yours,

Mr. J. H. Tates,
The University of Chicago.

PDB:GB

XX

The University of Chicago
Office of the Counsel and Business Manager

335240

ROOM 1838, 230 SOUTH CLARK ST.
TELEPHONE DEARBORN 9312

October Fifteen
1 9 2 3

President Ernest D. Burton,
The University of Chicago.

My dear President:

This is merely a suggestion
based on the mention of the fact at the
Expenditures meeting.

It may be that we are taking
Dr. Stieglitz from research for administra-
as Director of Laboratories,
tive activities, which some other member of
the faculty could equally well conduct. He
is so conscientious that if any of the
members of this office or the campus people
call his attention to details, he gives his
time to them when it seems to some of us that
others, less important in research, could
attend to those items.

You will know.

Very truly yours,

WH:EB

Wallace Heckman
Wallace Heckman.

331940

The University of Chicago

Office of the Council and Academic Affairs

October Fifteen
1953

President James D. Burton,
The University of Chicago

My dear President:

This is merely a suggestion
based on the mention of the fact at the
Independent meeting.

It may be that we are taking
Dr. Stille's term research for administrative
as Director of Laboratories.
five activities, which some other member of
the faculty could equally well conduct. He
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You will know.

Very truly yours,

Wallace Neuman

Members of the Commission

CH. MARIE, *General Secretary*,
9 Rue de Bagneux, Paris
G. CARRARA (Italy)
ERNST COHEN (Holland)
PAUL DUTOIT (Switzerland)
ALFRED EGERTON (England)
E. W. WASHBURN (U. S. A.)

Annual Tables

OF

CONSTANTS AND NUMERICAL DATA PHYSICAL, CHEMICAL, AND TECHNOLOGICAL

Published by an International Commission under the authority
of the
International Research Council
and the
International Union of Pure and Applied Chemistry

Received files
to W. B. Burton
Upon return send to FILES
APR 11 1924
Sent from PRESIDENT'S OFFICE
APR 8 1924

XX
American Advisory Committee

(Appointed by the
National Research Council)
WILLIAM DUANE, *Chairman*
JOHN F. THOMPSON
GEORGE K. BURGESS
C. E. K. MEES
H. E. HOWE
F. B. JEWETT

OFFICE OF THE AMERICAN COMMISSIONER
NATIONAL RESEARCH COUNCIL
WASHINGTON, D. C.

Sent from PRESIDENT'S OFFICE
MAR 13 1924

to Dr. Stieglitz
Upon return send to FILES
Received files APR 7 1924

March 10, 1924.

Ernest DeWitt Burton, D. D., President,
University of Chicago,
Chicago, Ill.

Dear President Burton:

I am enclosing for your information a statement concerning International Annual Tables of Constants, an international publication which is prepared and published annually by an International Commission appointed by the International Union of Pure and Applied Chemistry.

This undertaking is financed by means of contributions from the various countries of the world and the budget which has been approved for the next five years calls for an annual contribution of \$5000 from this country. As you will note from the enclosed statement, part of this sum is made up of contributions from scientific and technical organizations, part by contribution from the United States Government, and part from the National Research Council. There still remain several hundred dollars to be raised in order to complete America's portion of the budget.

I am writing to ask if the University of Chicago would be willing to become one of the supporters of this international work to the extent of an annual contribution of \$100 for the next four years. Educational institutions which contribute in this way to the budget of Annual Tables will be listed among the contributors in the annual reports of the International Commission. Such institutions will also receive gratis one copy of all volumes of Annual Tables published during the years covered by the contribution, and the institution, as well as any member of its faculty, will be privileged to purchase directly from the Paris Office additional copies of any volume at a discount of 25% on the regular prices.

Your library doubtless possesses at least one and probably several copies of each of the volumes thus far published and

Annual Tables

OF
CONSTANTS AND NUMERICAL DATA
PHYSICAL, CHEMICAL, AND TECHNOLOGICAL
Published by an International Commission under the authority
of the
International Research Council
and the
International Union of Pure and Applied Chemistry

Members of the Commission
Dr. Marie Curie (Paris)
Dr. Paul Pictet (Geneva)
Dr. Albert Einstein (Bern)
Dr. E. W. Washburn (U.S.A.)
Dr. G. G. Stokes (London)
Dr. J. D. Van Duijn (Amsterdam)
Dr. H. A. Lorentz (Amsterdam)
Dr. P. G. W. van der Werf (Amsterdam)

OFFICE OF THE AMERICAN COMMISSIONER
NATIONAL RESEARCH COUNCIL
WASHINGTON, D. C.
MAR 13 1924

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Chicago, Ill.

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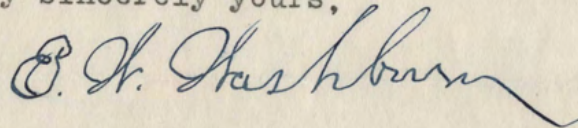
International Research Council
(Appointed by the
National Research Council)
William D. Coolidge
Louis F. Thompson
George E. Hughes
C. E. K. Meade
H. E. Howe
F. B. Lewis

Received from
Upon return send to files
MAR 13 1924

would, in the ordinary course of events, doubtless purchase one or more of all future volumes. Consequently an annual contribution of \$100 will, in many cases, not involve an expenditure by the University in excess of what would ordinarily be involved in the purchase of the volumes.

Hoping that the University of Chicago will assist in this important undertaking, I am

Very sincerely yours,

A handwritten signature in dark ink, appearing to read "E. W. Washburn", with a long, sweeping flourish extending to the right.

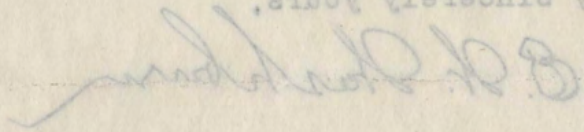
E. W. Washburn,
American Commissioner

Contributions to the budget of Annual Tables should be made payable to the National Research Council, marked "Account of Annual Tables," and mailed to the American Commissioner.

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E. W. Washburn,
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CH. MARIE, *General Secretary*,
9 Rue de Bagneux, Paris
G. CARRARA (Italy)
ERNST COHEN (Holland)
PAUL DUTOIT (Switzerland)
ALFRED EGERTON (England)
E. W. WASHBURN (U. S. A.)

Annual Tables

OF

CONSTANTS AND NUMERICAL DATA PHYSICAL, CHEMICAL, AND TECHNOLOGICAL

Published by an International Commission under the authority
of the
International Research Council
and the
International Union of Pure and Applied Chemistry

American Advisory Committee

(Appointed by the
National Research Council)
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OFFICE OF THE AMERICAN COMMISSIONER
NATIONAL RESEARCH COUNCIL
WASHINGTON, D. C.

1. History of the Undertaking. - The International Commission charged with the preparation of Annual Tables was inaugurated by the International Congress of Applied Chemistry at London in 1909, confirmed by the International Congress of New York and Washington in 1912 and was later taken under the auspices of the International Association of Academies. During the war the publication of the Tables was temporarily suspended but through the self-sacrificing efforts of the secretary of the Commission, the work of collecting data went on uninterrupted and the publication of the Tables has now been resumed under the auspices of the International Union of Pure and Applied Chemistry and of the International Research Council.

2. Purpose of the Undertaking. - The annual volumes published by the Commission contain all the numerical data, physical, chemical, engineering, metallurgical, biological, etc. published anywhere in the world during the year. Full literature references and method of measurement are also given. These data are collected in the various countries of the world by national committees of abstractors who examine carefully, page by page, all of the publications of the country which are at all likely to contain such data; thus, for example, in the United States 60 publications are thus examined annually. In order to avoid errors due to copying the pages of the publications containing the data are clipped, pasted, classified and sent to the central office in Paris where all of the material received from the various countries is collected and arranged for publication. The scientist, or engineer, therefore, who consults a volume of Annual Tables for a given year may feel confident that, if he does not find the data sought in that volume, then no measurements of the quantity in question have been published during that year. It is thus evident that the organization which has been built up for this work is much more efficient than any one man could hope to be who undertook to search the literature to ascertain whether any measurements of a given quantity had been made during a given year.

3. The Financing of the Work. - The financing of this undertaking is accomplished in two ways; first, by means of contributions from the various countries represented in the Union of Pure and Applied Chemistry and, second, through receipts of sales of the Tables. In accordance with the budget for the next five years, which was presented to and adopted by the International Union of Pure and Applied Chemistry at its meeting in Lyons in June 1922, the sum of 200,000 gold francs per annum for the next five years was authorized for Annual Tables. The allocation of this charge to the various participating countries was on the pro rata basis of 500 francs per million inhabitants with the exception of France, which, in view of the location of the headquarters of the Commission in Paris, agreed to contribute 1250 francs per million inhabitants; and with the further exception that, for the present, account would be taken of the exchange situation in the case of certain of the smaller countries suffering under a greatly depreciated currency.

Annual Tables

CONSTANTS AND NUMERICAL DATA
PHYSICAL CHEMICAL AND TECHNOLOGICAL
Published by the International Commission under the authority
of the
International Research Council
and the
International Union of Pure and Applied Chemistry

Members of the Commission
Dr. Max von Laue (Germany)
Dr. Paul Durot (France)
Dr. G. Carls (Italy)
Dr. Hans Conen (Holland)
Dr. Paul Durot (Switzerland)
Dr. Albert Einstein (England)
Dr. E. W. Washburn (U.S.A.)

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(Appointed by the
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William D. Coolidge
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OFFICE OF THE AMERICAN COMMISSIONER
NATIONAL RESEARCH COUNCIL
WASHINGTON, D. C.

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The apportionment of the United States under this budget is \$5000 per year and this apportionment has been approved by the executive board of the National Research Council of the United States of America, which further voted to assume the obligation of soliciting, collecting and transmitting this sum annually to the proper authorities in Europe. Of this sum \$2000 will be supplied annually by the trustees of Critical Tables in the return for services to be rendered by Annual Tables to Critical Tables under a contract recently executed between these two organizations. This leaves the sum of \$3000 to be otherwise provided. Toward this sum the United States Government has in the past and probably will in the future contribute \$500 per year. The following scientific societies have contributed in the past and may be expected to contribute in the future the sum set opposite their names:

	<u>Per Annum</u>
National Research Council (through International Critical Tables	\$2000.00
U. S. Government	500.00
National Academy of Sciences	200.00
Philosophical Society of Washington	50.00
American Philosophical Society	100.00
American Academy of Arts and Sciences	200.00
American Association for the Advancement of Science	200.00
American Institute of Chemical Engineers	50.00
American Institute of Electrical Engineers	100.00
American Electrochemical Society	50.00
American Chemical Society	500.00
American Ceramic Society	50.00
American Society of Civil Engineers	100.00
American Society of Mechanical Engineers	100.00
American Society for Testing Materials	100.00
American Institute of Mining and Metallurgical Engineers	50.00
American Medical Association	100.00
New Jersey Zinc Co.	50.00
	\$4500.00

This leaves the sum of \$500 to be raised from other sources. In view of the fact that engineering, biological and medical data are included in the scope of the Tables, it is hoped that a number of the universities and colleges whose faculties are engaged in research in the physical and biological sciences and their applications will join with the national scientific and engineering societies in contributing to America's share of the budget and thus insuring the continuance of this important work.

4. American Sales.- Of the total number volumes of Annual Tables sold each year, the United States of America takes approximately one-third. Four volumes have thus far been published. The first three cover the years 1910, 1911, and 1912 and the last volume, in two parts, covers the years 1913, 1914, 1915 and 1916. Volume 5, covering the years 1917 to 1922 inclusive is now in press. After the publication of volume 5 annual publication will be resumed.

The apportionment of the United States under this budget is \$2500 per year and this apportionment has been approved by the executive board of the National Research Council of the United States of America, which further voted to assume the obligation of soliciting, collecting and transmitting this sum annually to the proper authorities in Europe. Of this sum \$2500 will be supplied annually by the trustees of Critical Tables in the return for services to be rendered by Annual Tables to Critical Tables under a contract recently executed between these two organizations. This leaves the sum of \$3000 to be otherwise provided. Toward this sum the United States Government has in the past and probably will in the future contribute \$800 per year. The following scientific societies have contributed in the past and may be expected to contribute in the future the sum set opposite their names:

Per Annum	National Research Council (through International Critical Tables)
\$2500.00	U. S. Government
500.00	National Academy of Sciences
200.00	Philosophical Society of Washington
50.00	American Philosophical Society
100.00	American Academy of Arts and Sciences
200.00	American Association for the Advancement of Science
50.00	American Institute of Chemical Engineers
100.00	American Institute of Electrical Engineers
50.00	American Electrochemical Society
500.00	American Chemical Society
50.00	American Ceramic Society
100.00	American Society of Civil Engineers
100.00	American Society of Mechanical Engineers
100.00	American Society for Testing Materials
50.00	American Institute of Mining and Metallurgical Engineers
100.00	American Medical Association
50.00	New Jersey Zinc Co.
\$4800.00	

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XX

The University of Chicago

Department of Chemistry

March 18, 1924

President E. D. Burton
University of Chicago

Dear Dr. Burton:

In accordance with authority granted to me by President Judson to protect the life and limb of students in the laboratory against the carelessness and stupidity of fellow students, by dismissing from the privileges of the laboratory any student guilty of gross carelessness by means of which he has exposed himself or his fellow students to extreme danger, I found it necessary on March 15 to dismiss Mr. Thomas Hill for the period of March 15 to the end of the Spring Quarter, 1924. In order to have the case protect students in the future against similar neglect, I have posted the inclosed notice in the laboratory in which the accident occurred, and in the main hall of Kent. Mr. Hill was notified that this action would be taken.

It is extremely fortunate that Mr. Hill did not lose both of his eyes, and that none of the students in the immediate neighborhood of the explosion was injured. We cannot rely on good fortune, and I am sure that the method indicated is the best attitude we can assume toward such cases. It is the common attitude in European laboratories where men are held to account for negligence arising from stupidity, ignorance, or wilfulness.

In conclusion, I wish to emphasize the fact that there is nothing in the accident or in the action taken which should be held to lower the scholastic standing of Mr. Hill. He was very honest and frank about the source of the trouble, and acknowledges that he is lucky to have escaped without the dreadful penalty of the loss of his eyes. A similar explosion caused the loss of eyesight of Professor Campbell of the University of Michigan thirty years ago.

I am giving you these details so that you may have a fair picture of the situation, and I trust that you will continue the authority as granted by President Judson to act in similar cases.

Yours truly,

Julius Streptiz

JS/MS

XX

The University of Chicago
Department of Chemistry

March 18, 1934

President E. D. Burton
University of Chicago

Dear Dr. Burton:

In accordance with authority granted to me by President Judson to protect the life and limb of students in the laboratory against the carelessness and stupidity of fellow students by disallowing from the privileges of the laboratory any student guilty of gross carelessness or stupidity of which he has exposed himself or his fellow students to extreme danger, I found it necessary on March 18 to disallow Dr. Thomas Hill for the period of March 18 to the end of the Spring Quarter, 1934. In order to have the case protect students in the future against similar neglect, I have posted the enclosed notice in the laboratory in which the accident occurred, and in the main hall of Kent. Mr. Hill was notified that this action would be taken.

It is extremely fortunate that Mr. Hill did not lose both of his eyes, and that none of the students in the immediate neighborhood of the explosion was injured. We cannot rely on good fortune, and I am sure that the method indicated is the best attitude we can assume toward such cases. It is the common attitude in European laboratories where men are held to account for negligence arising from stupidity, ignorance, or willfulness.

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I am giving you these details so that you may have a fair picture of the situation, and I trust that you will con- sider the authority as granted by President Judson to act in similar cases.

Yours truly,

Julius Stieglitz

March 18, 1924

NOTICE

Mr. Thomas Hill, student in Qualitative Analysis 6 has been barred from laboratory privileges in Kent Chemical Laboratory from Saturday, March 15 until the end of the Spring Quarter, 1924.

The grounds for this action ^{are} that he exposed himself and his neighbors in the laboratory to the loss of ^{his} eyesight or worse, by (1) non-fulfillment of the instructions taken to protect students against accident in the carrying out of the Marsh test for arsenic; and (2) gross carelessness in the lighting of a stream of hydrogen from a generator without first proving that the generator was free from air and did not contain an explosive mixture.

Julius Stieglitz,
Director

JS/MS

March 18, 1934

NOTICE

Mr. Thomas Hill, student in Analytical Chemistry, has been barred from laboratory privileges in the Analytical Chemistry Laboratory from Saturday, March 18 until the end of the Spring Quarter, 1934.

The grounds for this action are that he exposed himself and his neighbors in the laboratory to the loss of his eyesight or worse, by (1) non-fulfillment of the instructions given to protect students against accidents in the carrying out of the tests for arsenic; and (2) gross carelessness in the lighting of a stream of hydrogen from a generator without first proving that the generator was free from air and did not contain an explosive mixture.

John H. H. H.
Director

18/34

XX

April 7, 1924

My dear Dr. Stieglitz:

When by mutual agreement you were sometime ago relieved of your responsibilities as Director of Laboratories nothing quite definite was said, so far as the records of this office or my memory indicate, respecting the effect upon your salary, though my letter of November eighth might be taken as intimation that the discontinuance of service would involve discontinuance of the stipend. Personally I should have been glad if in making the budget for the new year the small amount hitherto paid you for your services as Director of Laboratories could have been added to your salary as professor, leaving your income from the University unchanged. The construction of the budget for this year has however proved to be a very different matter from that of last year, and extremely difficult. Under the circumstances then and in view of the necessity of limiting expenses at every possible point may I assume that it will be satisfactory to you to discontinue your salary as Director without compensating increase of your salary as Professor?

Very truly yours,

Dr. Julius Stieglitz
The University of Chicago

EDB:HP

April 7, 1934

My dear Dr. Stieglitz:

When by mutual agreement you were sometime ago

relieved of your responsibilities as Director of Laboratories
 nothing quite definite was said, so far as the records of this
 office or my memory indicate, respecting the effect upon your
 salary, though my letter of November eight might be taken as
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 the circumstances then and in view of the necessity of limiting
 expenses at every possible point may I assume that it will be
 satisfactory to you to discontinue your salary as Director
 without compensating increase of your salary as Professor?

Very truly yours,

Dr. Julius Stieglitz
 The University of Chicago

EDB:HP

The University of Chicago
Department of Chemistry

XX
Sent from PRESIDENT'S OFFICE

APR 12 1924

to Mr. Plinkerton

Upon return send to FILES

Received files APR 21 1924

April 9th/24.

My dear President Burton:

It would be well worth

the value of my time to me to be relieved of
the duties of Director of the University Laboratories
without any increase of my professional com-
pensation. I have a large amount of unpublished
research work waiting for time for final editing.

There was no implication when I resigned
that the difference in salary would be made
good by additional professional salary and
I understand very well the difficulties
the University is facing in drawing up a
feasible budget for next year.

Very truly, yours,
Julius Stieglitz

757.05

Sent from PRESIDENT'S OFFICE

APR 12 1924

to Mr. [illegible]

Upon return send to KILLEN

APR 21 1924

The University of Chicago

Department of Chemistry



April 11/24

President's Office:

It would be well worth
the value of my share to me to be released
the value of the University's resources
without any increase of my personal contribution
further. I have a large amount of unpublished
manuscripts existing for some time past
There was no publication when I returned
that the difference in value
and by additional personal value and
I understand very well the difference
the University is facing in clearing up a
possible budget for next year.

Very truly,
[illegible]

357.02

The University of Chicago

Department of Chemistry

XX
Sent from PRESIDENT'S OFFICE

APR 8 1924

to Mr. Butler

Upon return send to FILES

Received files APR 11 1924

April 4, 1924

President E. D. Burton
University of Chicago

Dear Dr. Burton:

My report to you on the application for a contribution from the University of Chicago for the work on the Annual Tables of Constants, etc. has been delayed through the difficulty of securing from the University of Chicago Press a clear statement in regard to the question of profit or loss connected with the fact that the University of Chicago Press is the American Agent of the Annual Tables, and has been the agent since the Tables were started.

I find that it has cost the University \$1200 to \$1500 in the course of these years to take care of the American agency for the Annual Tables. It was undertaken in the first place as a contribution to science and not for profit. In my judgment I believe this assistance rendered the Annual Tables should be considered a sufficient contribution, and I would recommend that in replying to Dr. Washburn this fact be brought out.

Yours truly,

Julius Stieglitz

JS/MS

The University of Chicago
Department of Chemistry

April 4, 1934

President E. D. Burton
University of Chicago

My report to you on the application for a
contribution from the University of Chicago for the
work on the Annual Tables of Constants, etc. has been
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American agency for the Annual Tables. It was under-
taken in the first place as a contribution to science
and not for profit. In my judgment I believe this
assistance rendered the Annual Tables should be con-
sidered a sufficient contribution, and I would recommend
that in replying to Dr. Washburn this fact be brought out.

Yours truly,

Robert A. Raper

18/34

XX
Sent from PRESIDENT'S OFFICE
APR 8 1934
Upon return send to FILES
APR 11 1934
Received from

The University of Chicago

The University Laboratories

OFFICE OF THE DIRECTOR

March 11, 1924

Vice President James H. Tufts
University of Chicago

Dear Dean Tufts:

I have your note of March 6 in regard to future administration of the matter of tuition vouchers for assistants. May I urge for your attention the following considerations which I think should weigh decisively against any change of plan toward replacing free tuition vouchers by increase in pay. The granting of free tuition is a moral asset which outweighs by far the money value involved, and the University would lose outright the whole value of this moral asset. Students coming here as assistants should be treated as junior members of the staff, and be made to feel as part of the official family. That is the case in all the universities with which I am familiar, and certainly true of the large universities with which we compete for high grade assistants and graduate students. As it is, the money remuneration is higher in most of the other large universities, and we bank on the high standing of the University of Chicago and the moral effect of being selected to junior appointments as assistants. I feel quite positive that any change of policy for the sake simply of bookkeeping would be a most unwise step which would lead to no advantages whatsoever, and the serious drawbacks indicated.

There is a minor financial consideration which should be considered, but which is of much less weight than what I have just now indicated. That is, that assistants could very well register for less than full work, and sometimes they should register for less than full work, in view of the time spent in assisting. If the new plan goes through, they would be paid for tuition which would not revert to the University, but would go into their own pockets.

Fellows are in a different position--they come outright primarily for study, and they have a much lighter load of required teaching. The title fellow is an honorary one, whereas the title of assistant means nothing unless the incumbent is treated as a junior member of the staff of a department.

I have repeatedly emphasized these considerations in discussions with Mr. Plimpton. The one object to be gained, as far as I understand it, is the saving of some bookkeeping and the listing of the same items in the debit and credit accounts of the University. I think the immense value of the moral weight emphasized above more than offsets these business considerations, good as they are.

There is no question whatsoever of our deceiving ourselves as to the expense of assistants. It is entirely right that the charges for tuition, etc. should be a charge against a department. Mr. Plimpton has introduced that system, and I heartily agree with him.

Yours sincerely,

Julius Stieglitz

JS/MS

*Obrien that
all chairman
of laboratory
departments
should agree
with this
statement.
J.S.*

The University of Chicago

The University of Chicago

OFFICE OF THE DIRECTOR

March 11, 1934

Vice President James H. Latta
University of Chicago

Dear Dean Latta:

I have your note of March 8 in regard to future administration of the matter of tuition vouchers for assistants. May I urge for your attention the following considerations which I think should weigh decisively against any change of plan toward refunding free tuition vouchers by increase in pay. The granting of free tuition is a moral asset which entitles the assistant to the money value of his tuition, and the University would lose outright the whole value of this moral asset. Students coming here as assistants should be treated as junior members of the staff, and be made to feel as part of the official family. That is the case in all the universities with which I am familiar, and certainly true of the large universities with which we compete for high grade assistants and graduate students. As it is, the money remuneration is higher in most of the other large universities, and we rank on the high standing of the University of Chicago and the moral effect of being selected as junior appointments as assistants. I feel quite positive that any change of policy for the sake simply of bookkeeping would be a most unwise step which would lead to no advantages whatever, and the various drawbacks indicated.

There is a minor financial consideration which should be considered, but which is of much less weight than what I have just now indicated. That is, that assistants could very well register for less than full work, and sometimes they should register for less than full work in view of the time spent in assisting. If the new plan goes through, they would be paid for tuition which would not revert to the University, but would go into their own pockets.

Below are in a different position. They are entitled primarily for study, and they have a much lighter load of required teaching. The fact that they are not paid for tuition is a disadvantage of assistantship nothing which the University is prepared to justify as a justification of the staff of a department.

I have repeatedly explained these considerations in discussions with Mr. Livingston. The one point to be noted, as far as I understand it, is the granting of some bookkeeping and the issue of the same items in the field and credit accounts of the University. I think the balance value of the moral asset indicated above more than offsets these drawbacks considered good as they are.

There is no question whatever of our desiring ourselves as to the expense of assistants. It is entirely right that the change for tuition, etc., should be a charge against a department. Mr. Livingston has introduced that system, and I heartily agree with him.

Yours sincerely,

8, K

The University of Chicago

Department of Chemistry

May 19, 1924

Vice President J. H. Tufts
University of Chicago

Dear Dean Tufts:

I have your letter of May 10 in regard to the recommendations made for Summer Quarter appointments.

** No research work is required as of full time members of the Chemistry Staff.*

In regard to the case of Dr. Link, recommended for \$300 extra pay, the following should be noted: Dr. Link's present appointment at a salary of \$1200 is explicitly on a half time basis*. We could not hope to have a member of the staff of her training and experience at any such salary except by that special arrangement. With the \$300 extra pay for the special summer work, we find it possible to keep her well satisfied, and I believe a total of \$1500 for her services is none too much. She puts in fifteen hours a week in charge of classes of one hundred to one hundred and forty people in the general chemistry laboratory, and that work might normally be counted full time service. I think the University is fortunate in securing her services on the basis recommended. For the work she is doing she is unusually well adapted, the students having great confidence in her.

In regard to the case of Dr. Hellerman, research instructor at \$1800, who is recommended to receive \$600 for teaching general chemistry 1 and 2 in the summer, kindly note the following: The auditor is mistaken in the assumption that research instructors are supposed to work four quarters as a matter of general policy. The first research instructor appointed by the University was for Dr. Nef, from 1892 until his death in 1915, and for very many years, Nef's research assistant was the only one in the employ of the University. In order to secure the services of a Ph.D., Dr. Nef had an allowance of \$1500 for nine months' service, and finding that it was impossible to hold men of Ph.D. training at such a salary, for many years he arranged with the University that they should do ^{extra} summer quarter work at a salary of \$500 or \$600.

That is precisely the situation in regard to Dr. Hellerman at present. After the death of Dr. Nef, I tried to get along with men who did not have the Ph.D., but were working for the degree, and after seven or eight years' trial, I have given up the effort as a wasteful and unsuccessful plan. The services of a fully trained

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The University of Chicago

Department of Chemistry

Handwritten initials: J. H. H.

May 19, 1934

Vice President J. E. Telfer
University of Chicago

Dear Dean Telfer:

I have your letter of May 10 in regard to the recommendations made for summer appointments.

In regard to the case of Dr. Link, recommended for \$3000 extra pay, the following should be noted: Dr. Link's present appointment at a salary of \$1200 is explicitly on a half time basis. We could not hope to have a member of the staff of her training and experience at any such salary except by that special arrangement. With the \$3000 extra pay for the special summer work, we find it possible to keep her well satisfied, and I believe a total of \$1800 for her services is more than enough. She puts in 12-14 hours a week in charge of classes of one hundred to one hundred and forty people in the General Chemistry Laboratory, and that work might normally be counted full time service. I think the University is fortunate in securing her services on the basis recommended. For the work she is doing she is unusually well adapted, the students having great confidence in her.

Handwritten note:
The President has
approved the
of full time
services of the
chemistry staff.

In regard to the case of Dr. Hoffer, recommended for \$1800, who is recommended to receive \$600 for teaching General Chemistry I and 2 in the summer, kindly note the following: The matter is mistaken in the assumption that research laboratories are supposed to work four quarters as a matter of general policy. The first research laboratory appointed by the University was for Dr. H. H. Hoffer until his death in 1915, and for very many years, but research and teaching was the only one in the history of the University in order to secure the services of a full time professor. It was impossible of \$1800 for his normal services, and thinking that it was impossible to hold him of \$1800 for such a salary. For many years he returned with the University that they should be summer quarters work at a salary of \$300 or \$400.

That is precisely the situation in regard to Dr. Hoffer. After the death of Dr. Hoffer, I tried to get along with one who did not have the Ph.D., but was working for the degree, and after seven or eight years' trial, I have given up the effort as a wasteful and unsuccessful plan. The services of a fully trained

man, as represented by the Ph.D., are measurably superior to those of less completely trained people. In order to hold a man of first rate ability--Dr. Hellerman made Phi Beta Kappa, and took his Ph.D. "Magna Cum Laude"--without increasing the burden of expense to the University, I arranged with Dr. Hellerman to pay him \$1800 for nine months' work, including the \$1500 which the former research assistant, Mr. McBride (a non-Ph.D.) received, together with \$300 from our assistants' fund, by turning over to Dr. Hellerman for part of his time, the care of laboratory assisting for which we formerly paid another man \$300. This involved no new expense for the University. In addition, Dr. Hellerman was assured that we would give him an opportunity for Summer Quarter service in place of calling in an outsider like Professor Mullinix of Rockford College, and if possible pay him a total income of \$2400 for the eleven months' service. All of this involved not a penny of extra expense to the University, and had the advantage of my securing a Magna Cum Laude Ph.D. as research instructor to help me take care of ten to fifteen Ph.D. candidates and develop further lines of original work.

I am sure the auditor will find every statement made verified by the records of the University. I trust that the appointment for \$600 will be approved, because otherwise I will lose the services of a first class man, and will have to content myself with a second or third rate man.

If the auditor would like to put all research assistants and instructors on the annual four quarter basis, I am sure Dr. Hellerman would not object, provided his total salary for the four quarters were made \$2400. As our Ph.D.'s go out and receive \$2400 for nine months' work, I believe the Department has been sufficiently economical and careful of the interests of the University on the basis proposed.

I am

Yours sincerely,

Julius Stieglitz

JS/MS

man, as represented by the H.D., are necessarily superior to those of less completely trained people. In order to hold a man of first rate ability--Dr. Hoffer made this point--and work his H.D. "Magna Cum Laude"--without increasing the burden of expense to the University, I suggested with Dr. Hoffer that we pay him \$1800 for nine months' work, including the \$1500 which the former research assistant, Mr. Hoffer (a non-H.D.), received, together with \$300 from our assistants' fund, by turning over to Dr. Hoffer for part of his time, the care of laboratory assisting for which we formerly paid another man \$300. This involved no new expense for the University. In addition, Dr. Hoffer was assured that we would give him an opportunity for research service in place of "calling in an outside life" Professor William of Rochester College--and if possible pay him a total income of \$2400 for the seven months' service. All of this involved not a penny of extra expense to the University, and had the advantage of my securing a Magna Cum Laude H.D. as research instructor to help me take care of ten to fifteen H.D. candidates and develop further lines of original work.

I am sure the auditor will find every statement made verified by the records of the University. I trust that the appointment of \$800 will be approved, because otherwise I will lose the services of a first class man, and will have to content myself with a second or third rate man.

If the auditor would like to put all research assistants and instructors on the annual four quarter basis, I am sure Dr. Hoffer would not object, provided his salary for the four quarters were made \$2400. As our H.D.'s go out and receive \$2400 for nine months' work, I believe the Department has been sufficiently economical and careful of the interests of the University on the inside proposed.

I am

Very sincerely,

James H. Hoffer

10-22