



FAMILIAR SIGHT to many chemists in 1912 was the reception room-&-office of Mellon Institute. The custom was for each new Fellow to hang up his pennant.

Roy Hunt had started in a 24-by-70-foot shed on Smallman Street, discuss "Aluminum in Engineering" (what did they make of Blough's prediction that "one day you'll see *aluminum buildings* rise up from the streets"?)

Through the years, coal and mining and the thermochemistry of explosives also held the interest of the Section, and on May 19, 1910, it felt justified in dispatching a document to William Howard Taft, President of the United States, pointing out

"That the Pittsburgh Section, American Chemical Society, recognizing the ability shown by Dr. Joseph A. Holmes of the technological branch of the United States Geological Survey as a practical chemist, and being familiar with his able work as a chief engineer of the Government Testing Station at Pittsburgh do

Hereby unanimously endorse him for appointment to the directorship of the newly created United States Bureau of Mines."

Next meeting they reaffirmed the resolution and urged the President to act at once. He did.

R.K.D. Meets the Section

By 1911, still other institutions were joining the iron and steel laboratories as centers of research, and an enthusiastic address on "Industrial Fellowships" was given the Section by young Robert Kennedy Duncan, Professor of Industrial Chemistry and Director of Chemical Research at the University of Pittsburgh and the University of Kansas, from whose work the world-famous Mellon Institute of Industrial Research would come.

One of Dr. Duncan's pioneer fellows at the then "Industrial Research Laboratory of the University of Pittsburgh," Dr. Henry A. Kohman (a chemist who could tell his wife *he'd* spent a hot day over a kitchen stove, too) spoke on his unique work with salt-rising bread.

In September of 1912, the first scheduled meeting was called off as the members rushed about after laboratory hours to prepare for the impending visit of the Eighth International Congress of Applied Chemistry; everything came off splendidly.

And early in the following year, the public got its first chance to meet with the chemists, when the Section invited everyone to hear Dr. Arthur L. Day, Director of the Geophysical Laboratory of Washington's Carnegie Institution, talk on the



R.K.D.—he burned with a gem-like flame.

"Chemistry of Kilauea," the Hawaiian volcano, in the large lecture hall of Carnegie Institute in Oakland.

An earnest young student of Dr. Duncan's, one Edward R. Weidlein, came by train from Kansas to give his first paper before the Section: his work on the preparation of adrenalin from the suprarenal glands of whales. This was in January, 1914. In February, at the age of 46, tireless Dr. Robert Kennedy Duncan, "one of the Section's best known and most respected members, a worker whose broad vision of industrial research has greatly advanced the ap-

plication of chemistry," was dead.

For five days in March of 1914, Pittsburgh chemists had a field day listening to the great Dr. Wolfgang Ostwald of Leipzig talk on colloid chemistry to joint meetings of the Section and the Mellon Institute staff.

But the horizons were already dimming . . . and on June 28, 1914, an Austrian archduke, Francis Ferdinand, and his wife, Sophie, were murdered in the cobbled streets of Sarajevo.

In September we find the Section voting to send a circular to all manufacturers in the area, offering "immediate assistance in overcoming the difficulties arising from the stoppage of chemical imports brought on by the War in Europe."

The first of the many wartime meetings of the Section began: on December 17, 1914, Dr. Harold Hibbert spoke on the freezing of nitroglycerine and its detonation by shock, and even, at the group's insistence, performed experiments on the same!

One interesting little bit of Section business took place at this time. Caught by the rising prices, the Section had begun to print an advertisement on the back of its monthly announcement. This permitted it to issue a four-page leaflet instead of the usual postal card. At the January 1915 meeting, one Founding Father vigorously protested this, observing that "such a method of securing funds to meet the expenses of the Section is unnecessary and undignified." The Section vetoed *his* veto, however, it being the opinion of the group that advertising in the United States "was probably here to stay..."

A Rally for Priestley

On October 21, 1915, Professor Phillips sounded another of his calls

to the Section. "The old Priestley home at Northumberland," he warned, "is threatened with destruction. The chemical societies must take action to preserve the home of this great 18th Century chemical investigator."

A committee was set up to arouse the nation's chemists. Thirty-four Sections answered the call; today there is a permanent Priestley restoration, a shrine for all American chemists.

But the immediate job before the Section was the war. (And war nerves ran high. There was a \$12.35 deficit for tobacco at the annual Smoker!) Columbia's Dr. Marston Taylor Bogert, new chairman of the Chemical Committee of the National Research Council, trained into Pittsburgh to set forth the "research and development work expected of chemists in war time," and laid specific problems before the Section, such as the combatting of poisonous gases. As we shall see, he came to the right place.

It was in this year, incidentally, that a pioneer Pittsburgh radium researcher, Dr. Charles H. Viol, proposed that the Section found a medal to be awarded for meritorious service . . . A harbinger of the Pittsburgh Award, this, although the ill-fated Dr. Viol would not himself live to see his idea converted into bronze.

During these early war years, too, the Section kept an interested eye on the old arsenal grounds, corner of 40th and Butler Streets. Here was the National Bureau of Standards, and here our Albert Bleininger was making tests on every European clay he could get his hands on to discover just what their magical powers were and what we could do now that imports were stopped. What he learned: those lowly U. S. clays, if properly mixed, would work as well!

Dr. Bleininger's work on spark-plug porcelains, so vital to the army of that day, is still standard, and he was the first to see that alumina would some day revolutionize the spark-plug industry. On a homelier level—if any one man is responsible for the advance of American tableware, that again was the Section's A. V. Bleininger.

Today, the Bleininger Memorial Award, named for the frail boy who waded through icy water in winter below the Willow Junction kilns as a firer to support his fatherless family, is the nation's highest award for achievement in ceramics. In the years, it was to go to *three* Pittsburgh Section researchers: S. R. Scholes, E. Ward Tillotson and Stuart Phelps.

The Crucible is Born

"Greeting! members of the Pittsburgh Section of the American Chemical Society. THE CRUCIBLE greets you out of its heart of hearts and hopes that you are glad to see it . . . It knows that it is one of the signs of the times—the dawn of a new day for the chemist. It hopes to play a small part as the interpreter of that glo-

WHAT THE WELL-DRESSED CHEMIST wore in '17. Bill Hamor helped start the Chemical Warfare Service, thought up its retorts & benzene ring.



rious new day to the people of the Pittsburgh District."

The year was 1918, the month February. Volume 1, number 1 of a new publication was off the presses, the labor-of-love of John O'Connor, who was not a chemist at all but who was so imbued with the brave-new-world spirit of the young Section that he worked to build a publication of value to his city's chemists.

O'Connor was assisted by another non-chemist, his secretary Miss Jennie Herron, who valiantly kept *THE CRUCIBLE* alive month after month when her boss left Mellon Institute on leave-of-absence to work for the government in Washington; she saw to it that the newly-created voice of Pittsburgh chemists did not meet an untimely end.

History's Muse can shrink from nothing; her eyes are wide. It must be recorded that a joke also appeared in an early *CRUCIBLE*—the second issue, in fact.

"Ruth is an alchemist I know,
And so I'll have to drop her.
For every time I'm out with her,
My silver turns to copper."

Its innocuousness deceives; it was the opening wedge for hundreds of variations on the archetypal theme of the Battle of the Sexes, especially the influence of money and domesticity on the mysterious thermodynamics of love.

Colonel R. F. Bacon, director of Mellon Institute and faithful counselor of the Pittsburgh Section, returned from France on November 17, 1918 after ten months of active service as chief of the Technical Division of the Chemical Warfare Service, AEF, and gave the Section an inside picture of the new gases.

Actually, the Chemical Warfare Service began in the Pittsburgh Section (its very insignia came from the hand of Mellon Institute's Major

William Hamor). The first German mustard gas attacks had been, psychologically, not unlike the Hiroshima bomb. General Pershing burned up the cables to Washington; the military looked to laboratory science to counteract the new horror.

At once, the General Staff asked Bacon to assemble the personnel for a "front-lines" AEF research laboratory in France and they deputized C. G. Fisher to equip it.

(That was a time when emergency knew no law. The Pittsburgh chemists ran off impressive letterheads—"Chemical Warfare Service, U.S.A."—*this* was their "priority number.")

Contents of German mustard duds were analyzed on the spot and the data rushed back to America to Colonel William H. Walker (formerly Professor of Chemistry at Pittsburgh High School), in charge of the Edgewood Arsenal. Thanks to this three-way play, we were soon producing in *drums* what the Germans had made only in *flasks*.

Operation Gas Mask

Not only were Pittsburgh Section men the initiators of the Chemical Warfare Service of the United States, but the first gas masks used on the Western Front (April 22, 1915) by the *British* forces were made from models created in Pittsburgh by Mellon Institute's James Bert Garner.

In addition, the Gas Defense Division of the Medical Department, *in one year of war*, developed a gas mask equal to that of any belligerent, so that American troops soon were supplied exclusively with American masks. This, as it later came out, was largely due to the enterprise and initiative of two other Section members: Bradley Dewey of the Sanitary Corps and George A. Burrell of the Bureau of Mines.

PITTSBURGH SECTION OF THE
AMERICAN CHEMICAL SOCIETY

G. D. CHAMBERLAIN, CHAIRMAN
CARNEGIE STEEL CO., BRADDOCK, PA.

IRVING C. ALLEN, SECRETARY
U. S. BUREAU OF MINES, PITTSBURGH, PA.

The 99th regular meeting of the Pittsburgh Section of the American Chemical Society will be held in Room 302, Thaw Hall University of Pittsburgh, Grant Boulevard, Thursday, June 19, 1913, at 8 p. m.

PROGRAM

The Oxidation of Mercury. Prof. G. A. Hulett, Chief Chemist,
U. S. Bureau of Mines.
Notes on Carbon Combustion Tubes. C. S. Johnson, Crucible
Steel Co. of America.

IRVING C. ALLEN, SECRETARY

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UNIQUE in the annals of world chemistry are the local section papers of the ACS. And unique among these is THE CRUCIBLE: it's the only one to have come out as a daily during the national conventions of 1922 and 1936. It grew from a postal card in 1908 (fig. 1) to a 4-page leaflet in 1914, to an 8-page journal in 1918 (fig. 2). Today (fig. 3), it's a crisp, handsome 32-page journal, one of the Section's largest, but it still has time for a good-natured parody of a TIME cover as in announcing a Pittsburgh Award for the coal world's H. H. Lowry in 1952 (fig. 4).

seventeen

The Crucible

Published Monthly

by the
PITTSBURGH SECTION OF THE
AMERICAN CHEMICAL SOCIETY



VOLUME I.

FEBRUARY, 1918.

NUMBER I.

THE 142nd MEETING

Pittsburgh Section
AMERICAN CHEMICAL SOCIETY
Thursday, Feb. 21, 1918, at 8:15 P. M.
Mellon Institute, University of Pittsburgh

"OPTICAL GLASS"

—BY—
A. E. WILLIAMS

of the United States Bureau of Standards.

Mr. Williams is a graduate of the Department of Ceramic Engineering, Ohio State University. Since his graduation he has been actively engaged in various commercial plants and in conducting researches not only in the domain of the glass industry, but also in other ceramic fields. These latter researches were carried out principally at the University of Illinois, where he was an instructor in the Department of Ceramic Engineering. Some of this work included the manufacture of barium and ruby glasses. For the past two years, Mr. Williams has been connected with the United States Bureau of Standards. At the Bureau, he has developed an optical glass laboratory and also a small plant capable of supplying a certain amount of the needs of the United States Government for various uses.

Members of the Section should welcome the opportunity to hear Mr. Williams tell of the great strides made in America in the development of the optical glass industry, both from the manufacturing and laboratory standpoint.

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NOT MEN FROM MARS—only Oakland—wearing Jim Garner's pioneer gas masks of World War I.

The General Staff had asked Burrell to set up a research laboratory at Washington University and gave him shiny eagles to wear on his high-collared uniform.

Thus it was to *THE CRUCIBLE* that a doughboy-chemist naturally sent the following gem from "Somewhere in Germany," signing it merely "Poetic License 67-449":

My gas mask, 'tis of thee,
Sweet air of purity,
Through thee I breathe.
I love thy cocoa C,
Formin and alkali;
O'er top I try to see
And spit beneath.

Let gas pollute the breeze
And shells bounce off the trees;
Their power is gone.
With K-permanganate
And soda-calciate
I sneer at Fritz's hate
And carry on.

Another of Colonel Burrell's achievements came to light after the war's end as well. It was he who had initiated helium work at the Bureau of Mines early in the war. In his work with natural gas (from which he was the first to extract gasoline) he found that gas from the Petrolia field in Texas contained 35% nitrogen, reasoned the helium content must be high as well.

It was. Over 0.90%, in fact. And by the time the armistice was signed, 45,000,000 cubic feet of the precious non-flammable stuff was available for kite balloons and dirigibles.

In this early "battle of the laboratories," the Section lost several of its most loyal members. Men like Lieutenant H. C. Engelbrecht, who succumbed while experimenting with phosgene in the American University Experiment Station gas tests at Washington. And S. H. Diehl, who rushed into the blazing inferno of the "dynol" plant at Oakdale to pull out workers and lost his own life when the nearby TNT building exploded—the outstanding hero of the catastrophe that leveled the Aetna Chemical Works on May 18, 1918.

Theme Song

Pittsburgh Section accomplishments in the war had given the chemist a prestige heretofore unknown by him, and in May, 1919, when biochemist Elmer V. McCollum came in from Johns Hopkins to discuss those strange new "vitamines" (leave that "e" on, it was 1919), the record crowd included for the first time even more visitors than chemists, despite the transportation strikes sweeping the city.

Thus it was in this period that the Section, through its *CRUCIBLE* and the newsreleases it placed in the Western Pennsylvania press, began to hammer upon a theme: the professional status of the chemist. Hundreds of now-yellowed clippings from the *Chronicle Telegram*, the *Dispatch*, the *Gazette Times*, the *Leader*, the *Press*, the *Sun*, with headlines like "Pittsburgh May Retain World Trade Through Its Chemists," "Section Foresees Everyday Uses for Radium—Pushbuttons that glow in the dark," and full-page signed articles by the Section publicity com-

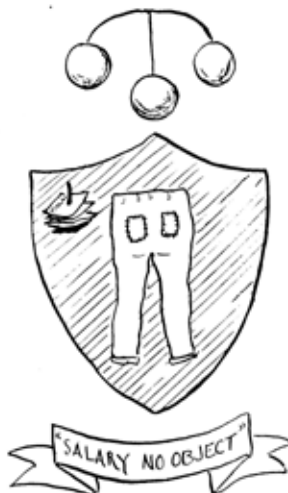
RAISING the salaries of post-World-War-I chemists was one Section objective. Section artist called this "Suggested Coat-of-Arms for Chemists."

mittee's Charles Skeele Palmer, point to an almost unbelievably successful campaign.

The battle for the *economic* recognition of the chemist by management was still an uphill one, however. (Nice wartime-salary for an analyst in a rubber factory was \$1,200 a year.) As late as 1925, the Section took cudgels editorially after reading a National Preservers Association announcement that the Association was considering getting a chemist for its new program, estimating "We could get a mighty good one at \$1500 or \$1800."

"Chemists," **THE CRUCIBLE** pointed out, "should be quick to resent such misuse of their name!"

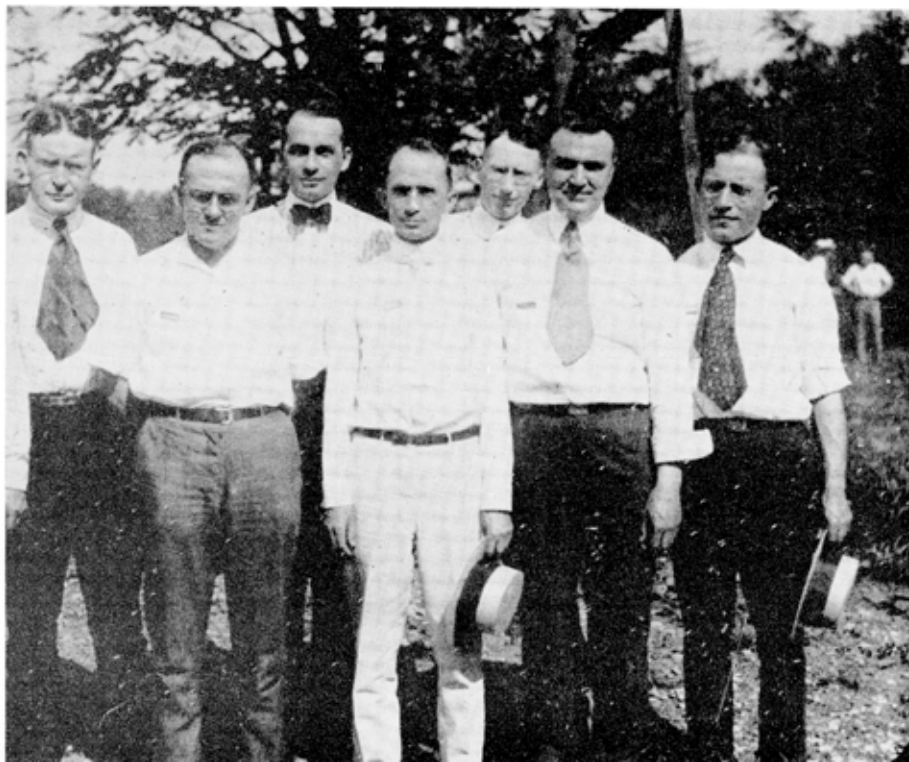
Especially underpaid was the *analyst*, and it was a Pittsburgh Section member, who, unable to forget



this, would in later years establish an annual award to be administered by the American Chemical Society specifically to honor and encourage work in the United States and Canada in *analytical* chemistry.

But to go back to the post-World War I scene. With most of the region's chemists back from service, the Section staged a huge affair,

AT THAT MEMORABLE 1919 picnic—William Hamor, Charles Nesbitt, Rufus Zimmerman, Earl Blough, Albert Bleininger, Chester Fisher, Arno Fieldner. Industrial research, steel, aluminum, ceramics, instrumentation, fuels research—all are here.



marking, in a way, the emergence of the group as a large, active civic organization now taking its place alongside the other associations of professional men in the district.

The hot July sun beating down on the grounds of The Pines on Perrysville Road . . . the crack of a bat, as the Steels played the Mines . . . the pungency of a chicken-and-waffle dinner . . . the sarcastic guest speaker, a pompous be-monocled "Austrian" scientist who scoffed at American chemists ("ach, disch-vaschers!") and worked the group up to a murderous pitch until he pulled off his moustaches and revealed himself as the local mimic, Luke Barnett: this was the first Annual Outing of the Pittsburgh chemists in the year 1919.

On January 15, 1920, Dr. Phillips, too ill to attend the Section meeting ("Where's Doc Phillips tonight?"), sent a blistering letter to the members, moving that . . .

"WHEREAS, many essential branches of manufacture in this country are dependent for their success or even for their existence upon a fully developed dyestuff industry, and

WHEREAS, during the period previous to and during the war, legislation wholly unfavorable to an American dyestuff in-

... PLUS MacTavish, 124 pounds of fire from the Jones & Laughlin steel laboratories. "Fisticuffs" was a perennial feature of the outings.



dustry has necessitated our dependence upon foreign lands for a meager supply of dyestuffs, and

WHEREAS, it is an established fact that in promoting the manufacture of dyes in the United States we should at the same time give encouragement to that branch of chemistry to which we owe the discovery and production of high power explosives so necessary to future national defense . . .

THAT the Pittsburgh Section of the American Chemical Society urge our Senators and Representatives the need of such laws as will fully and permanently protect the industry . . .

This was Dr. Phillips' last service. A month later, at the 162nd meeting of the Section he had helped father, it was moved that "suitable resolutions be sent to the family . . ."

F.C.P., born in April 2, 1850; who journeyed to Wiesbaden to learn from the lips of Regimus Fresenius himself; who for forty years headed the chemistry department of the University of Pittsburgh; who early was one of his country's top figures in hydrocarbons and who in 1913 gave American chemists their first compact, practical *Chemical German*; who did not live to complete his monumental *Life and Work of Joseph Priestley* but whose interest carried to the American Chemical Society, which established the gold Priestley Medal; who died at 70 from an illness contracted while nursing an invalid son . . . F.C.P. will long remain in the memory of the Section.

A Lady from France

Younger chemists do not always remember that for about a decade, 1911-1921, the radium center of the world was a five-minutes' walk from Mellon Institute. Here, at the corner of Forbes Street and Meyran Avenue, on the fourth and fifth floors of the Flannery Building, three Section members, Glenn Donald Kammer, Henry Titus Koenig and



WHEN PITTSBURGH SENT Glenn Kammer (center) to England to teach the nation's physicians how to use radium, Sir Ernest Rutherford put his personal laboratory at Kammer's disposal.

Charles H. Viol, crystallized over half the radium produced in the entire world, and it was here that the first radium *anywhere* was produced commercially.

Here, too, Viol edited *Radium*, a Standard Chemical Company house organ that was at the same time a genuine contribution to radiochemistry, ranking in importance with Leipzig's *Zeitschrift für medizinische Elektrologie und Röntgenkunde* and Paris's *Le Radium*. (The Technology Room of Carnegie Library still has a complete file—all that remains of this unique chapter in American chemistry.)

It was in the Standard Chemical Company's works in Canonsburg that carnotite ores from Colorado were converted to chlorides, and delivered by messenger on an interurban trolley to the Company's Forbes Street laboratories.

Although the ore was quite low-grade (about one gram of radium per 500 tons of concentrate, compared with one gram per *one* ton in European pitchblende) the wonders wrought by these chemists made it possible to produce radium reasonably enough for purchase by physicians and hospitals.

Mme. Curie herself had as her greatest interest—when she came to town in 1921 to receive an LL.D. from the University of Pittsburgh—to learn how Pittsburgh chemists could treat such poor ores so successfully and on so large a tonnage basis and she spent hours in Canonsburg with Louis Vogt, the Section member who headed the radium works there. She asked many questions, he reminisces. But she wouldn't disclose anything in return, though.

It is interesting that the experiments of Kammer and Viol with fluorescent materials during World War I (inducing the effect in crystallized zinc sulfide with radioactive materials) provided illuminated control devices for airplanes even in that war . . . a principle to be utilized

MARIE SKŁODOWSKA CURIE met the Section in 1921, and with Louis Vogt and James Gray toured the radium works in nearby Canonsburg.





THE THREE B's—Germany's Berl, Italy's Bruni, England's Sir Lawrence Bragg—a few of the international figures who widened horizons for the Steel City's analysts.

during World War II, of course, in many other ways.

Radium eventually killed all three—Kammer, Koenig and Viol—but their work has made it possible for thousands of people to be cured of cancer without injury to physician or lab technician.

More Hands Across the Sea

In 1922 the National Convention of the American Chemical Society was held in Pittsburgh and the Section set up an exhibit of industries characteristic to Pittsburgh in Carnegie Museum.

In the spring of 1923 the Section brought Dr. Guisepppe Bruni, one of Italy's foremost chemists, to address the section on "Italy's Part in Chemical Scientific Development" and later, Sir Robert Robertson (K.B.E., D.Sc., LL.D., F.R.S.), chemist to the British government and chief man behind the new propellants developed in World War I. Later yet, they heard Dr. H. F. Coward, of the safety-in-mines research board of Great Britain, speak on "Flame" (after all, it was the Flaming Twenties) and give some striking demonstrations of the ignition of gases.

In this period, the Section was proud of the Rezilal steels of vet-

eran member Charles M. Johnson; the work on olefine gases and their derivatives by George O. Curme; and Ralph E. Hall, who brought out the economic importance of chemistry to the community with his addresses on feed-water chemistry. With his talks, the education of the public on waste waters (today a nation-wide objective) was under way.

In this period, too, the Section was especially active in its smoke control interests. And it was a problem; in 1923 everyone was talking about a new novel by E. C. Rath that had on its jacket blurb: "*A young chemist from Pittsburgh with aspirations to make Pittsburgh the cleanest city in the world, starts West on a trip for his nerves. His adventures are among the most enjoyable in recent fiction.*" Title of the book: "The Nervous Wreck"!

Now, too, the Section was host to its old parent, the Engineers Society of Western Pennsylvania, as well as the American Society for Steel Testing, the American Electrochemical Society, the American Ceramic Society and other groups when it invited Harvard's Dr. Albert Sauveur (billed as "the Nestor of metallography") to address the Pittsburgh Section at the U. S. Bureau of Mines.

NARY A pH on their minds as 500 chemists (and wives or sweethearts) sailed down the Ohio on what came to be an annual outing.

The Section continued to make news when, in the fall of 1926, it played host to foreign delegates to the International Union of Pure and Applied Chemistry, their wives, and the American committee. Among them: Prince Conti, the Italian chemical manufacturer; Sir William Jackson Pope, of Cambridge; Professor Camille Maitgnon of the College de France; and Professor Stefan Minovici of Yugoslavia.

In June 1928, probably to cool off from the years-long round of activities sponsored by the group, the whole Section sailed 45 miles down the river and back on an Ohio steamboat.

"What They Did In Pittsburgh"

The big talk in the winter of 1930, spring of '31, was of the new Mellon Institute going up at the cor-



ner of Bellefield and Fifth, the largest excavation in Pittsburgh history (100,000 cubic yards of earth), and of its new laboratories.

That year Dr. Frederick E. Brethut, President of the American Institute of Chemists, gave the Institute's Gold Medal to Andrew W. and Richard B. Mellon and announced that the activities of Mellon Institute

"have assisted in bringing to the United States the largest chemical industry in the world and have led not only to the training of a large number of young scientists and technicians but also to the creation of new industries. What they have done in Pittsburgh has become more or less a part of

EN ROUTE to Section meetings in the winter of 1930-1931, members made a point of stopping to watch the Big Hole awhile (see any sign of our auditorium yet?)



our industrial fabric and technological organization, but it required great vision and courage to see this twenty years ago when research was still merely an unwelcome stepchild in most of our industries."

In 1932 the Section got a sobering picture of *another* fabric, *another* organization, when Colonel Burrell returned from Russia at the end of the second of his two trips to develop the natural gas and oil industry there. The Pittsburgh chemist had talked with Government officials, engineers, professional men, laborers, peasants; he had taken motion pictures (this was 1932, remember) of the never-never land that stretched

Emeritus with the quotation "Thus shall it be done to the man whom the King delighteth to honor." To the Section, he was a last link with a world known only in books: born in Wurttemberg in 1855, he had trained at Tübingen under Fittig, one of the great organic chemists of the 19th Century, in whose laboratory, Dr. Stahl would tell us, "those old long-beam balances were so slow I could smoke a cigar between swings."

The good Doctor Scientiae Naturalis, who as a child had seen Donati's Comet streak across the



GRAND OLD MAN of Pittsburgh chemistry—Karl Friedrich Stahl—cuts a piece of cake of the Section honors his 90th birthday. Ten former chairmen helped host.

from Leningrad to the Caucasian Mountains. And his summary of the government:

"It is ruthless in converting the people to its methods, and any means—persecution, coercion, or extermination—are applied as the necessity arises . . ."

In 1932, too, the Section created a new office when its 566 members installed Dr. Stahl as Chairman

sky, was to become the U. S.'s chief specialist on the manufacture and use of hydrofluoric acid, and he invented a new packing for sulfuric acid carboys that became universal. (His last "public" appearance was at the Section's June picnic in 1946. A month later, while waiting to board a street car after a visit to the library, he was struck by a truck and died in his 92nd year.)