

to which Berthelot refers, but Jābir is never tired of pointing out the errors of other chemists and insisting upon the superiority of his own theories and methods. He even curses them in the manner of the Latin works.

8. The style of the Latin works does indeed resemble that of the Schoolmen, but so does that of many of the Arabic works of Jābir. I would refer especially to the first twelve sections of the "Book of Properties," and to the "Book of Definitions."

9. Arsenic as one of the principles of metallic bodies is referred to by Jābir in Book I. of the "Hundred and Twelve Books" (quoted by Al-Jildakī in vol. ii. of the "Nihāyat at-Ṭalab"). "Arsenic" here refers of course to the arsenic sulphides, realgar and orpiment. It will be noticed that the Latin Geber does not insist upon the necessity of arsenic; in this he is in agreement with Jābir. Both agree in regarding the prime constituents of metals to be sulphur and mercury.

10. I have explained Berthelot's insistence on the difference in style between the Latin works and the

Arabic treatises as due to the fact that Berthelot was unlucky in his choice of the latter.

11. I cannot say whether the Arabic Jābir definitely mentions nitric acid, *aqua regia*, and silver nitrate. It is unfortunate that the pages referring to solutive waters are missing from the British Museum MS. of the "Book of Properties," especially as I believe this MS. to be unique. Al-Jildakī mentions a "solutive water" (*ma' al-ḥilāl*) which was used to dissolve out silver from a gold-silver alloy; I presume this must have been nitric acid. Al-Jildakī, however, lived after the date of the earliest MSS. of Geber's works.

I ought to say that I have hitherto examined by no means all of the available material, and that in the present article I have only very roughly sketched out the case for the identity of Geber and Jābir. I hope to deal with the subject much more fully in the future, but the question of the identity of Geber is so important for the history of chemistry that it seemed desirable to publish a preliminary account of some of my conclusions.

### The Alleged Discovery of the Virus of Epidemic Influenza.

THE recent report in the daily press that the cause of influenza had been discovered by Drs. P. K. Olitsky and F. L. Gates, of the Rockefeller Institute, N.Y., might lead the layman to believe that the problem was solved. There is no published evidence to show that this is correct. The facts are briefly these. Influenza is the greatest pandemic disease known and may be traced to the most remote periods of which we have historic data. One of its great outbursts (1889-1890) coincided with the bacteriological epoch in science, and by means of the technique devised by Robert Koch, one of his assistants, R. Pfeiffer, distinguished by the accuracy of all his work, isolated (1892) a small rod-shaped microbe since universally called *Bacillus influenzae*. This microbe, not easy to cultivate, was missed by all the investigators before Pfeiffer, but his work was subsequently regarded as correct.

In succeeding years influenza as an epidemic disappeared and little was heard of Pfeiffer's bacillus in bacteriological literature. In 1918, under the title of Spanish influenza, the disease again appeared, and sweeping over the inhabited world like a prairie fire, caused immense morbidity and mortality everywhere. The microscopes of bacteriologists were riveted on the disease processes of the plague. The results of tried investigators varied, but with prolonged experience and suitable methods the bacillus of Pfeiffer was found almost everywhere in cases of the disease. Dissident voices were, however, raised here and there, partly owing to inability to find the bacillus, partly owing to the fact that when found it was difficult to prove its causal relation to influenza, as animals are by no means so susceptible to the disease as man.

It was believed and stated, in fact, that Pfeiffer's bacillus was not and could not be the cause of influenza, which was to be sought in some hitherto unknown or unrecognised agent. Among those who held this view must be mentioned Gibson Bowman and Connor, who, attached to the B.E.F. in France, published statements (1919) to the effect that influenzal secretions which had

been forced through bacterial-proof filters, gave rise in monkeys, rabbits, mice, and guinea-pigs to a disease closely resembling that of human influenza. They claimed to have transmitted the disease from animal to animal in series. They believed that the virus was a "filter passer." Independently, Bradford, Bashford, and Wilson made similar claims, which they afterwards withdrew. Following the same lines, Maitland, Cowan, and Detweiler of Toronto recorded entirely negative results and directed attention to grave errors which might arise in interpreting results believed to be positive. What were described as typical effects by the supporters of the filter-passing-virus theory were shown by the Canadians to occur in animals that had never been inoculated at all but which had been intentionally killed. This fact has since been abundantly confirmed by Branham (1922) and shown by her to occur when death is brought about by a blow on the neck. It is along the same route that the Rockefeller investigators have proceeded, from whose work it is now claimed that the etiology of influenza is settled, and it is claimed that the virus is a body called by them *Bacillus pneumosintes* (σίντρις, injurer or devastator—from its supposed deleterious effect on the lungs).

In the last two years Olitsky and Gates have published a long series of papers in the *Journal of Experimental Medicine*, giving the results of their inquiries. Their claims are based on the following statements. (1) Influenzal throat secretions diluted and filtered through Berkefeld filters produce symptoms which cannot be produced by similar filtrates from normal persons. The symptoms—in rabbits—are fever, conjunctivitis, and a diminution in the number of leucocytes in the blood, a symptom which is very characteristic of the influenza disease in man. None of the animals died of the experimental disease, but on being killed, the lungs were found mottled and hæmorrhagic. (2) The lesions in the lungs are said to be transmissible in series. (3) Although none of the experimental animals died, they are stated to have been rendered

more susceptible to a later infection by Pfeiffer's bacillus. (4) In the filtered washings peculiar "bacilloid" bodies were found measuring  $0.15-0.30 \mu$  in their long dimension. The nature of these bodies—at first uncertain—was ultimately believed to be micro-organismal. Hence the name *Bacillus pneumosintes*. (5) Inoculation of cultures of the so-called bacillus followed by injections of *B. influenzae* resulted in the production of consolidation of the lungs with hæmorrhagic œdema and emphysema. (6) A certain degree of immunity is stated to follow injections of *B. pneumosintes*. (7) Inoculation of the bacterium is stated to evoke certain antibodies which are of a specific character. It may be stated that "cultures" of the microbe were obtained only on the highly complicated Smith-Noguchi medium, and especially under anaerobic conditions.

Before assuming that all these statements are correct it may be stated with respect to this microbe—if it is a microbe—that bacilloid and other like bodies indistinguishable in appearance from *B. pneumosintes* may occur in tubes of Noguchi's medium which has never been inoculated at all and nevertheless is sterile. The "bodies" appear to be due to some transformation of

the colloid material of the medium itself. Such transformations may occur in tube after tube and give rise to the erroneous interpretation of successful transmission of the culture. Further, it is remarkable that the "microbe" does not kill the experimental animals, but that when they are killed afterwards they show changes admittedly indistinguishable from those seen in killed animals never inoculated. One great obstacle to the successful study of influenza would appear to be that animals are much less susceptible than man, and that as soon as the question of human inoculation is introduced, great difficulties ensue in excluding other sources of infection. Recently, Lister in South Africa, working on lines identical with those of Olitsky and Gates, has found, like them, *Bacillus pneumosintes* or similar "culture," but on inoculating such unheated cultures into human beings, 13 in number, he had only one success, a typical attack of uncomplicated influenza, after a nineteen-hours incubation period. It may be that the cause of influenza has been located in *B. pneumosintes*, but before this can be accepted by the bacteriological world in general it will be necessary to adduce many more cogent reasons than have been forthcoming so far.

W. B.

### Obituary.

PROF. FRITZ COHN.

FRITZ COHN, director of the Berlin Rechen-Institut, died on December 14 after an operation. He was born at Königsberg on May 12, 1866, and studied first at the Gymnasium and afterwards at the University there; after further study at the University of Berlin he was placed on the staff of the Königsberg Observatory in 1891 and remained there till 1909.

Cohn's work included a discussion of Bessel's observations between 1813 and 1819, and a determination of the declinations and proper motions of the stars used in the International Latitude stations. He published catalogues of the stars used for the Eros campaign in 1900-1, and of 4066 other stars observed with the self-registering micrometer of the Repsold transit circle.

In 1909, Cohn was appointed to the chair of theoretical astronomy at Berlin, and director of the Rechen-Institut. He took part in the Paris Conference of 1911 which arranged for combination of work between the national almanacs, to avoid needless duplication of labour. The time thus saved was devoted to investigations on the minor planets, and the Institut took the leading part in deducing their orbits, and in arranging plans for sharing the observing work among different observatories. He showed great skill in keeping up the necessary accuracy of computation without any waste of labour. He also carried on the *Astronomisches Jahresbericht* after the deaths of Wislicenus and Berberich, and left the MS. for the 1921 volume practically complete at the time of his death.

Cohn married a daughter of C. F. W. Peters, director of Königsberg Observatory, in 1898, and leaves a son and two daughters. A fuller account of his life and work is given by J. Peters in *Astr. Nach.* 5208.

Cohn was elected an associate of the Royal Astronomical Society in June 1913.

A. C. D. C.

MR. P. C. A. STEWART.

It is with much regret that we record that Mr. P. Charteris A. Stewart, the well-known petroleum geologist and consultant to Viscount Cowdray's firm (Messrs. S. Pearson and Co.), met his death by drowning while bathing at Balandra Bay, Trinidad, B.W.I., during a recent short visit to the Islands.

For nearly twenty years Mr. Stewart has been connected with Messrs. Pearson's, and he had been closely associated with that firm in its important petroleum developments all over the world, more particularly in Mexico, Roumania, and Trinidad. Prior to this he held an appointment on the staff of the Geological Survey of Egypt.

Mr. Stewart's technical education was at the Royal School of Mines, where, in 1900 and 1901, he obtained diplomas in mining and metallurgy. Returning in 1904 he gained a further diploma in geology at the Royal College of Science in 1905. He was elected a fellow of the Geological Society of London in 1904, and was also a member of the Institution of Petroleum Technologists and the American Institute of Petroleum Geologists.

Mr. Stewart had travelled much, and by his wide experience and intimate knowledge of oilfield conditions in many countries he gradually built up a high reputation in his profession. His sound judgment in technical problems, backed by conscientious inquiry and skilful reasoning, made him an invaluable adviser to those whom he was privileged to serve. His death at the early age of forty-eight is a deplorable loss, one which will be keenly felt, not only by his colleagues, but also by his many friends, to whom he had endeared himself as a kindly, modest, and unselfish man.

H. B. M.