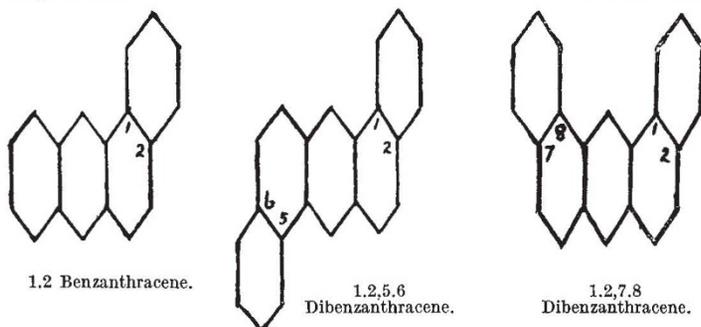


produced some compounds which both showed the three bands (but again shifted towards the invisible region) and were at the same time carcinogenic. The 1,2,7,8 compound was the most potent, but tumours were also produced by compounds of the 1,2,5,6 series.



Twort and Fulton found that chrysene is carcinogenic: its fluorescence spectrum is similar to that of benzanthracene but lies considerably nearer the region of short wave-length.

The spectrum of Schroeter's mixture is given by

a number of carcinogenic tars, including those obtained by heating certain animal or vegetable tissues: if acetylene tar is saturated with chlorine the bands are shifted towards the benzanthracene position and the carcinogenic potency at the same time reduced. Certain carcinogenic agents fail to

give the bands, whilst a few substances showing them are not carcinogenic. It thus appears that the spectrum is not specific for carcinogenic agents, but the presence of the spectrum without activity may merely indicate that a carcinogenic agent is present but in too low a concentration to affect the skin of a mouse: the fluorescence test is a much more delicate one than the production of cancer in mice. The frequent occurrence of this spectrum may, however, prove useful in the preliminary examination of various substances suspected of carcinogenic effect, and may finally lead to the detection of a pure compound or compounds having this action. When reached, this result may throw light on the origin of cancers developing spontaneously.

### Obituary.

DR. FRIDTJOF NANSEN.

DURING most of his lifetime the whole world has acclaimed Fridtjof Nansen as a man of the first magnitude, and his fame has grown as his years increased. His outstanding figure shines in history by its blending of almost all the elements of human greatness, and probably this is why the press writers of to-day, when setting forth his claims to immortality, have so often been swept away in a flood of panegyric. I knew Nansen for forty-one years, from the time of his first crossing of Greenland, throughout the struggle to launch his *Fram* expedition, and the laborious years spent over the scientific reports on the work it accomplished. I was with him year after year at the meetings of the International Council for the Exploration of the Sea, and at other scientific gatherings in many lands. He was frequent in his correspondence on questions regarding our common interests and the glow of his unfaltering friendship warmed my life. Knowing the difficulties he had to overcome as well as the triumphs he achieved, I trust that it is not presumptuous for me, now that few remain who knew him better, to survey his career from the point of view of a contemporary.

Thirty-four years ago I reviewed in these columns (*NATURE*, Dec. 31, 1896, vol. 55, p. 201) an English translation of the life of Nansen, which was written when most people believed that he had perished in the Arctic. There is little in that article that I wish to change, and it may still be read as supplementary to this.

Nansen had a great heredity in which the elements of his own personality can be clearly traced. Without going back to the old Viking strain which came out in his magnificent stature and rugged features, we find full proof in the recorded family tree. His

great-great-grandfather, born at the end of the sixteenth century, was a Dane, Hans Nansen, who as a lad spent a winter frozen in the ice of the White Sea, as a young man commanded a ship in the Iceland trade and wrote a book on the wonders of the sea, later becoming Burgomaster of Copenhagen, a prominent politician and a fervent patriot. His grandfather, Hans Leierdahl Nansen, nearly a hundred years later, was a Norwegian by settlement, a judge and government official, a keen politician, a man of many words rather than of action, but a patriot of the perfervid type, determined, if Norway must enter into close alliance with Sweden, that there should be no phrase in the treaty of union which could imply any inferiority in the partnership. His father, magniloquently named Baldur Fridtjof Nansen, and an aristocrat on his mother's side, was a quiet, studious man, occupying a responsible position in the legal profession, indifferent to outdoor sport, very strict in his parental oversight, governed in all things by inexorable principles. His mother, on the other hand, was a practical, energetic, strong-minded person who, as a girl, had horrified the prim society of the period by taking up the unmaidenly sport of ski-running, in which she excelled.

Nansen was born on Oct. 10, 1861, in a small country house at Store-Froen in Aker, near Oslo; they gave him the name of the hero of an old saga, and never was there an apter christening:

As the acorn wins to a sapling, as the sapling waxeth  
an oak,  
A goodly guard of the forest, and fronting the storm-  
wind's stroke,  
So grew in his beauty Frithiof; he waxed a man among  
men;  
In his heart was the love of all things, and his might  
was the might of ten.

Like his namesake of the northern mists, young Fridtjof grew up in the open, bathed in the ice-cold waters, risked his life a hundred times on fjord and fjeld, and beat all his comrades in every manly sport. When a student his name was noised abroad as the champion ski-runner of Norway, and his holiday excursions over the high fjelds in winter were marvels of endurance. He was probably no better at book learning than most of his contemporaries at the University of Christiania. His true education came from his contact with Nature in a land where the contrasts of scenery, of climate, and of season are at a maximum, serving by turns to sting life into action and to awe thought into sombre introspection. A strong poetic vein came to him from his ancestors: in the midst of his most strenuous exertions he would give expression to emotions that an ordinary athletic Englishman might be tempted to scorn as sentimentality, yet they were part of the man.

At the age of nineteen Nansen decided to take up biology as his life-work. Text-books did not attract him, but research was a mode of learning that made an appeal. To take a real grasp of any truth he had to discover it, or at least to recognise it, for himself. Priority was a question which did not trouble him at any time; in conducting an investigation he was intent on solving a problem which interested him mainly as a difficulty which he had undertaken to overcome.

Nansen's biological researches won for him the curatorship of the Bergen Museum and his Ph.D. degree; they were characterised as promising by the specialists, but they were probably little in advance of the average of post-graduate work. Biology was not the master-passion of Nansen's life; but it set him on his way when, in 1882, on board the sealer *Viking*, in the investigation of the polar fauna he first saw Arctic ice. At the age of twenty-six he seemed to be heading for a comfortable biological chair in a university; but the spirit of his fathers had leaped from the northern waves and pointed to another field of fame.

It is difficult for the present generation to realise the opposition to which Nansen's project of crossing the Greenland inland ice gave rise. Whymper, Nordenskiöld, and Peary had all tried to advance over the ice-cap from the west coast and all had failed. This young man resolved to succeed, first halving the distance to be traversed by starting from the east coast and providing no line of retreat. He wished to go forward, and forward he had to go, for there was no possibility of going back. He was to take a small party, and he devised light gear and special cooking apparatus. The authorities said no one could carry out such a plan; Nansen knew he could, and he did. He had been sure of success from the first and upheld his faith in himself with a firmness that would have struck a stranger as presumptuous obstinacy but for his modest bearing and the disarming sweetness of his smile.

Nansen's natural self-reliance and stubbornness were increased by his success and by the year's lecturing in all parts of Europe which followed. His mind conceived the far more ambitious project

of reaching the North Pole. Impressed by the extent and strength of the East Greenland Current and the vast quantity of ice and drift wood which it carried southward between Greenland and Iceland, he studied the problem of its origin and arrived at the conclusion that it must arise near the Siberian coast and probably flow across the pole. He proposed to reach the pole by "taking a ticket with the ice", so he put it, from some point north of Siberia, and letting it drift him across, be the time required what it might. He was confident in his own deductions and in the strength of his ship. He planned her not to resist the ice but to compel ice-pressure to lift her on to the surface of colliding floes. Once again he relied on the Forward policy, providing no line of retreat, staking his life and reputation on his faith in an idea. In the words of his mythical namesake, he might have said to those who tried to turn him from his purpose:

Now once for all I have chosen; the cost of my choice  
I know;  
And there lives not the man shall stay me the way that  
I choose to go.

Like his mythical namesake, too, he had an invincible ship, and a crew of true men, all equals, messing together and working together, and all devoted to their leader. The ship he named *Fram*, which means 'forward', and forward he went, defying all the rules of earlier polar exploration. Again, in the teeth of all expert advice and every traditional dictate of prudence, Nansen achieved success, though he did not reach the pole.

Nansen's fame was established, but there was no change in the man. He could not be any surer of himself or any more determined in the assertion of his own opinion than before; but he stood the storm of applause, unperturbed by the medals and the orders, the banquets and the flatteries, the publicity and the fortune which resulted. I have known almost all the great explorers of my time, and Nansen was the only one on whom an overwhelming success left no jetsam of deterioration. His manner remained as modest, his smile as winning as before. Not that he attained to any superhuman perfection. He still liked to draw the public eye, though he no longer displayed his fine figure in the tight-fitting athletic costume which attracted so much attention in the streets of the capitals after the Greenland expedition. He had not foreseen the depth of the Arctic Sea, and his oceanographical apparatus was inadequate. In his great march on the ice he had let his watch run down and lost his longitude; but from a boy he had felt himself under the influence of a lucky star and he had won through by sheer force of body and mind.

Physical oceanography took the first place thenceforth in Nansen's researches, and for several years he worked on the "Reports" of the *Fram* expedition, striving to make up for inadequate equipment by getting the very utmost out of the cleverly devised emergency methods used on the great drift. The scientific results were certainly of far-reaching value, but the chief glory of the *Fram* expedition was that it gave the death-blow to the

(Continued on p. 943.)

old style of polar exploring in naval vessels under officers ordered to carry out a plan devised by others. Since the *Fram*, the best polar work has been done by small parties of trained and well-equipped men under a leader following out his own plans by his own methods. It is doubtful, as the *Karluks* and the *Maud* haveshown, whether Nansen's theory of the ice-drift on the Polar Sea is correct; but it was the faith of the man that made him great, not the particular object of his belief.

With the present century, Nansen began a series of oceanographical expeditions in the research steamers of the Norwegian Government and sometimes in his own yacht, during which he attacked special problems of oceanic circulation. He took a leading part in the foundation of the International Council for the Study of the Sea in 1900 in co-operation with Sir John Murray. When the Council was established, Nansen stood out for having the central laboratory in Norway, and it was sometimes no easy matter to secure smooth working when his views differed sharply from those of other delegates. He was always so absolutely certain of the correctness of his own opinions that at times he did rather less than justice to his opponents, but even when argument only stiffened his opposition an appeal to his good nature often brought about a conciliatory compromise.

There was in Nansen a singularly engaging *naivete*, an example of which impressed me so greatly that the spot in Camden Road where he said it remains photographed on my mind. "You know," he said, "people say that I am very difficult to get on with; it's quite a mistake; only give me my own way and I'm the easiest fellow in the world to get on with."

While keeping the Norwegian share to the front at the Council meetings Nansen was doing his utmost, in co-operation with Helland-Hansen and Hjort, to establish Norwegian supremacy in oceanographical research, and extremely important advances have been made by them in the construction and use of apparatus and in the interpretation of the observations bearing on the circulation of the Norwegian Sea and the North Atlantic as a whole.

The political aspirations of his grandfather were rekindled in Nansen's mind when the question of separate consular representation for Norway threatened the union with Sweden, and had personal ambition been a leading motive in him his popularity was such that he could easily have made himself a dictator or a president. But he was ambitious only to secure a separate standing for his country, and the peaceful revolution which gave Norway a king of its own was largely Nansen's work. He would not enter into contentious politics at home, but took a pride in being the first Norwegian Minister to the Court of St. James's, a post he accepted from a sense of duty to his own people, and, despite his appreciation of the personal friendship of King Edward, he resigned with relief as soon as he felt that the new kingdom was fairly on its feet. He never cared for ceremony or formality of any kind, and he went back quietly

to his professorship of oceanography and to the joy of research in the open sea.

Nansen was attracted to the earliest history of the Arctic Seas and sought to link the Vinland of the Sagas with the Fortunate Isles of classic legend, finding satisfaction for the weird and wistful cravings of his mind in blurred legends which he strove, with only partial success, to elucidate in his historical work "In Northern Mists".

For a second time Nansen passed through the Kara Sea, and in a mission for the Russian Government travelled the length and breadth of Siberia in order to report on its resources. Then came the War, and the plight of Norway as a helpless neutral, with its shipping paralysed, brought him back to the service of his country as president of the Norwegian Union of Defence. In 1917 he went to America and secured by his personal influence an arrangement between Norway and the United States that saved his country from economic strangulation. When the War was over, he became one of Norway's representatives on the League of Nations, and all his greatness of heart and mind was thrown into the herculean task of repatriating prisoners of war, many of whom were lost in Russia, saving the remnants of Armenian communities from extermination, organising food supplies for the starving millions of eastern Europe, and using his unrivalled personal popularity as an instrument for fighting the worst evils arising from the War. The Nobel Peace Prize was never more worthily bestowed than when Nansen got it in 1923.

In 1925 he was elected Lord Rector by the students of St. Andrews, and in the following year he gave them a rousing rectorial address, in which he showed them how the spirit of adventure had been the unifying principle of his own life, inspiring his early explorations, his mature researches and the philanthropic missions in which he wore out the last of his tremendous strength. He said:

"It is our perpetual yearning to overcome difficulties and dangers, to see the hidden things, to penetrate into the regions outside our beaten track; it is the *call of the unknown*, the longing for the Land of Beyond, the divine force deeply rooted in the soul of men which drove the first hunters out into new regions, the mainspring perhaps of our greatest actions—of winged human thought knowing no bounds to its freedom."

The old love of adventure and the passion for research rose in a last flame of enthusiasm when he planned an airship voyage across the north polar basin in the *Graf Zeppelin*, and he had arranged to give a lecture on the subject to a joint meeting of the Royal Meteorological Society and the Aeronautical Society in March last; but the fatal illness baulked his will. He died at his home in Lysaker in his sixty-ninth year on May 13, 1930. Had he been able to lecture in March he would have tried to convince the sceptical British men of science of the soundness of his plans as he had tried to convince the British admirals in 1893. As in that case he would probably have failed, but had he lived to return successful, the doubting meteorologists, like the doubting admirals before them,

would have been whole-hearted in acknowledging that he was right. Nansen knew this well, and in one of his last letters to me he wrote: "I think I have had some evidence and experience as to the ability of your people to appreciate the achievements of foreigners as much as those of your own people. In fact, I never felt that I was a foreigner in England or Scotland." Their sense of kinship with Nansen led his British friends to initiate the *Fram* Preservation Fund while he was still alive, and now they can think of no worthier memorial to the man in his own land than the old ship secured for ever against the tooth of time, like the *Victory* at Portsmouth.

HUGH ROBERT MILL.

#### DR. FRANK R. BLAXALL.

DR. F. R. BLAXALL, who died on May 24 after a brief illness, was bacteriologist to the Vaccine Department of the Ministry of Health, a post he had held for just over thirty years. He established the Government Lymph Institute at Hendon and was responsible during this period for the preparation of the vaccine lymph issued by the Government, and the high reputation which this product deservedly enjoys is largely due to his care and painstaking work.

Blaxall received his medical education at University College and Hospital, and obtained his M.D. (Lond.) degree in 1890 with honours in medicine. After holding several resident hospital posts, he was appointed lecturer in bacteriology at Westminster Hospital Medical School and in 1896, in collaboration with Dr. Colcott Fox, published an important paper on ringworm in London. He now came under the influence of the late Sir Armand Ruffer and Prof. Allan Macfadyen at the British (now Lister) Institute of Preventive Medicine, and at its old headquarters in Great Russell Street investigated the bacteriology of rheumatoid arthritis, and with Macfadyen published a paper on the thermophilic bacteria—one of the early contributions to this subject. In 1896 he commenced an investigation with Dr. Monckton Copeman on the inhibitory action of glycerin upon the adventitious micro-organisms present in calf lymph, and their results were communicated to the Local Government

Board and to the Royal Commission on Vaccination then sitting, the outcome of this work being Blaxall's appointment as bacteriologist to the Vaccine Establishment, then in Lamb's Conduit Street.

From thence onwards, Blaxall's work was mainly concentrated upon vaccine lymph, and he published papers on the preparation of calf lymph and on the sterilising action of glycerin and of oil of cloves upon the adventitious micro-organisms of vaccine lymph, respecting which he became a recognised authority. He served as a member of the Smallpox and Vaccination Commission of the Health Committee of the League of Nations and of the Departmental Committee on Vaccination. To lifelong friends and colleagues, Blaxall's loss is indeed a heavy one.

R. T. HEWLETT.

WE regret to announce the following deaths:

Sir Thomas Walker Arnold, C.I.E., professor of Arabic in the University of London, English editor of the "Encyclopaedia of Islam", on June 9, aged sixty-six years.

Prof. J. B. Bradbury, for the past thirty-six years Downing professor of medicine in the University of Cambridge, on June 4, aged eighty-nine years.

The Right Rev. G. F. Browne, formerly Bishop of Stepney and of Bristol, sometime secretary of the Local Examination Syndicate at Cambridge and also (1887-92) Disney professor of archaeology in the University, on June 1, aged ninety-six years.

Major Sir Aston Cooper-Key, C.B., formerly chief inspector of explosives at the Home Office, on May 28, aged sixty-nine years.

Dr. Kiyoo Nakamura, honorary member of the Royal Meteorological Society, who was director of the Central Meteorological Observatory of Japan from 1895 until 1923, on Jan. 3, aged seventy-five years.

Mr. E. A. Sperry, inventor of the Sperry gyro-compass and other gyroscopic appliances, on June 16, at sixty-nine years of age.

Dr. G. N. Stewart, professor of physiology, Western Reserve University, Cleveland, Ohio, on May 28, at seventy years of age.

Mr. A. F. R. Wollaston, fellow and tutor of King's College, Cambridge, who served as medical officer and naturalist to the first Mount Everest expedition under Col. Howard Bury, on June 3, aged fifty-five years.

### News and Views.

SIR ARTHUR KEITH'S lectures on recent discoveries of fossil men, delivered at the Royal College of Surgeons during the month of May, and published in an abridged form in this week's Supplement, are likely to provide material for argument among anthropologists for some time to come. During the last decade, but especially in the last four or five years, there have been some remarkable accessions to our knowledge of early types of man. Palestine, Gibraltar, South Africa, East Africa, and most recently China, each in turn has yielded to the spade new types or new variants of known types. Each of these discoveries, it is safe to assume, helps us a stage on the way to final truth; but for the moment, it must be admitted, they add to the complexity of the problem

which the anthropologist seeks to solve. Sir Arthur Keith's lectures, in a comprehensive survey of the new material, aimed at showing how it could be adapted in building up a scheme of the origin, development, and distribution of early man. One of the most interesting of recent discoveries with which he dealt—probably quite new to most of his audience—was that of the remarkable skull from Gardar in south-west Greenland, for the description of which he was indebted to Dr. Hansen of Copenhagen. This skull is not, indeed, one of high antiquity, for it was found in association with the remains of Norsemen in a twelfth-century graveyard; but whether it be regarded as atavistic, as Dr. Hansen holds, or pathological as Sir Arthur Keith is inclined to think, its