

PROMINENT NEWS

Ardito Desio

by Franco di Cesare and Francesco Guidi

One of the most important Italian scientist, geographer, geologist. He raided the most difficult deserts in the world, has named some important fossils, geologically surveyed many inhabitable regions but his deep passion were the mountains, the snow-covered peaks. Now he rests but we believe his spirit dominated by poetry, scientific curiosity and strong determination is there between his mounts, to continue his work as he did up to end his 104 years of industrious life.

Ardito Desio, the Life and the First World War

He was born in Palmanova, in Friuli Region, on 18 April 1897, at the age of 18 years, he counterfeited his father's signature and volunteered to the First World War initially as dispatch-rider cyclist. During this initial period he went always in front line with great courage. In 1917 he attended the Cadet course and so he became Alpine Troop Lieutenant.



Figura 1: Ardito Desio during WWI, 1917

In November 1917 the Italian Army suffered the retreat of Caporetto and the Lieutenant Ardito Desio was made prisoner from the Austrians and confined in the concentration camps of Wegscheid and Plan (Bohemia) from where he went free after the Italian victory in November 1918, speaking and reading fluently German.

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Studies and Academy

In 1920 he obtained the degree in Natural Sciences from the Florence University. At this time there was no Degree in Geology but this branch was considered to be a part of the Natural Science Degree. From that moment he went to teach to the Universities of Florence, Pavia and Milan and in this latter University he founded, for the first time in Italy, the Institute of Geology which he directed from 1927 to 1972 when he had to retire for seniority.

His scientific production is substantiated by more than 400 papers which deal with the results of researches made in Italy and in different countries in Asia and Africa. He organized and directed 15 scientific expeditions and among these the expedition which climbed for the first time the K2 mountain of the Himalaya chain, the second high mountain in the world. He planned and realized a scientific laboratory in form of steel, aluminium and glass pyramid which was installed at the base of Mount Everest at the altitude of 5.050 meters (16.568 ft) in 1990.

His main results were reached in Libya in the period 1926–1940. Here he produced an excellent geological map of Libya (1939) which remained for a long period the only reliable scientific information; he discovered underground fresh water in several places. In 1932 he found an accumulation of potassium salts in the Marada Oasis but, very importantly, he could recommend to the Italian oil state company AGIP, that oil was present in the Sirte basin where many wells will be drilled, without reaching, unfortunately, the target for technical limits.

The Karakoram Massif, K2 Mountain. Ardito Desio, 1954

The conquer of the K2 Mount was a part of Ardito's soul and for this achievement he will be always very proud. After one first scout trip to the Karakoram massif in the team of Aimone Savoia-Aosta, Duke of Spoleto, Desio applied to the Pakistan Government for the authorization to climb the K2 but the Authorities refused because they had just authorized the American mission of dr. Charles Houston. This mission in 1953 failed the target so that Desio in 1954 reiterated his request and this time it was accepted.

The funds were granted by the Italian Alpine Club (Club Alpino Italiano, CAI), the Italian National Research Council (Consiglio Nazionale delle Ricerche, CNR) and the National Olympic Committee.

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All together 18 people were involved which utilized almost 500 porters. At 6 pm of 31st July 1954 the peak was reached by two Italian mountain guides: Compagnoni and Lacedelli. The old alpinists used to say that the climbing of a new mount requires sacrifices and grief and even the K2 has produced such a pain. Mario Puchoz 36 year old, from Courmayer (West Alps), died on 21st June 1954 by pneumonia contracted there. Before leaving Desio embedded in a wall of the K2 two plates with the following words engraved: *“In the memory of the fallen of K2: Art Gilkey, Dudley Wolfe, Pasang Kikuli, Phinsoo, Mario Puchoz”*.

“Dedicated to the memory of Luigi Amedeo di Savoia, Duke of Abruzzi and of Aimone Roberto di Savoia, Duke of Spoleto who guided the two Italian expeditions in these mountains. The components of the 1954 Italian expedition to Karakoram K2 have laid this after the victorious conquer following the road outlined half century ago on the Abruzzi spur”



Figure 2:
1954: K2 and Base Camp

Bramaputra Suture Line or Tsang-Po line

Before we abandon the Asia Continent it is worth to recall one of the most important discoveries made by Desio in 1973, when he was 76 and the most part of people of this age relax at home. Desio obtained from the Pakistan Government the authorization, which was granted with extreme difficulty, to make a trip along the Karakoram highway under construction at that time. A tough road, 700 km long, which connects the Indian Ocean to China, passing trough Pakistan and considered to be of military strategic importance.

August Gannser, a Swiss geologist, at the end of Fifties had considered that the collision between India and Paleoasia happens along a suture line. This line was put in evidence by Desio in the above trip along the Indus valley in 1973, having recognized the presence in the outcrops of the *glaucofane-schists facies*, which, with their unusually low geothermal gradients, are characteristic of metamorphism in collision zones. (Figure 3). This suture line continues along the Bramaputra valley (Chinese Tsang-Po valley). The geotectonic thrust continued after the collision and produced the India subcontinent subduction, except for the giant Mount Nanga

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Parbat spur (8.000 meters /26.240 ft) which thrusts over the Paleosia with several repetitions of crustal layers i.e. basalts (high seismic velocity) and granites (low seismic velocities).

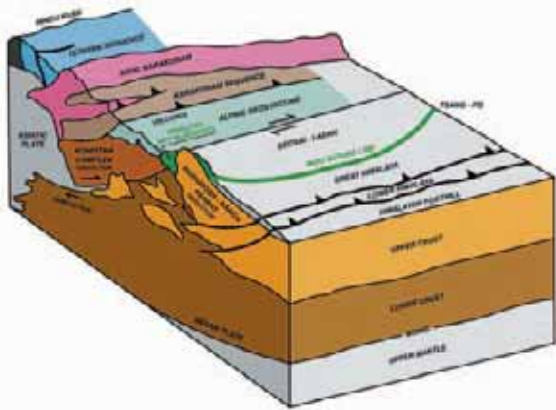


Figure 3:
*Sketch of the Karakoram-
Western Himalaya after Casnedi
1983, adapted on 2004.*

Love for Libya is Forever

Ardito Desio started his trips to Libya in 1926 and continued to spend all of his school vacations there until May 1941, some days before the date of 10th of June 1941 when Italy entered the Second World War. He arrived at Benghazi in Autumn 1926 and from there he went to Tobruk, Bardia, Giarabub and again to the South, without reaching the Oasis of Kufra this time. During the journey, after having left the dune region, they entered the flat zone of Erg where he noticed that the soil was made up by many little stones, with many quartz and feldspar crystals, in association with small fragments of fossil wood so that he concluded that these gravels had not an aeolian origin but they were the remains of very old rivers which had their origin in the Kufra mountains.

Tibesti

In 1936 he made his first flight to Tibesti region, as a consequence of an agreement which was signed between Italy and France on 7th January 1935 for the definition of the southern boundary of Libya with the French colonies of Western and Equatorial Africa. During this 1936 trip he started from Tripoli, went south to Ghat and from there Eastward to Kufra. From Kufra to Benghazi and back to Tripoli. He had the possibility to admire the volcanic picks of the area and integrate his observation with field reconnaissances. Another geological trip to Tibesti was made in Spring 1940 when war had already hit Old Europe. This time, having made the last portion of the trip by car he had the opportunity to better study the geological outcrops and define various fossils such as the famous *Bifungites fezzanensis* Desio, of Devonian Age.

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Carnallite, Phosphates and Oil

During his long stay in Libya, Ardito Desio gave the necessary attention to the mining exploration and devoted his attention to four main targets: the preparation of the first geological map of Libya; the possibility of discovering phosphates accumulations, definition of the size of carnallite deposits he had discovered in 1931 in Marada and eventually search for oil for AGIP

The Map of Libya, which was edited in 1939, has been for a long period, at least until Sixties, the only geological map available (figure 4).

Negative results were achieved for phosphate accumulation. For carnallite he defined the size of the deposits but incumbent war cancelled all the programs on the subject.



Figure 4: Desio, Geological Map of Libya. 1939

Ardito Desio, First Oil Explorer in Libya

One of the most interesting chapters of his life was undoubtedly his meeting with AGIP in the mid Thirties. It was his idea to start exploring for oil in Libya. In 1936, already professor of Geology of high standing, Desio was called to Libya by the Italian Government to study the local mining potential.

Desio began working at once assisted by two geologists: Tino Lipparini and Cesare Chiesa, with a chemist Vincenzo Mancuso and an engineer Elio Gravino. One of their tasks was to ascertain the presence of minerals, above oil, and to set up a systematic water exploration campaign. In July 1937, oil and gas were encountered near Tripoli, while drilling a well for water.

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This was the first sign of hydrocarbons in Libya. In record breaking times, AGIP unloaded 4 drilling rigs at Tripoli in March 1938: one Moore percussion, able to drill to a depth of 600 meters and three rotary ones, a real innovation for the time. Of these three rotary rigs, two were Calix Davis type, with a potential of 600 meters (2.000 ft), while the third one, a very powerful Trauzl Davis, could reach depth up to 1.500 meters (5.000 ft).

To start exploration, 8 stratigraphic wells, all positioned by Desio, were drilled to depths less than 500 meters (1.600 ft) while a ninth was drilled to 1.519 meters (4.982 ft), a record for Libya until after war. All the wells had been located on surface geological evidence, without the reflection seismic support. Mr. Cobolli Gigli AGIP's Chairman, while visiting AGIP operations in Libya in May 1940, warmly recommended to use the seismic system. In fact the Company was contracting an American seismic crew of Western Geophysical to work in Italy where it arrived on 10th of June 1940, the same day Italy entered the WWII. The war made impossible the utilization of seismic in Libya. Drilling continued until mid 1941 but it was interrupted because the war was reaching Tripoli. Any way Desio's conclusions on the hydrocarbon potential of Libya were stated by him as follows:

My geological researches were directed to define the existence in the Sirte region of a sedimentary basin which, starting from Cretaceous time (136 million years ago) was occupied by a great Gulf, the Paleosirtic Gulf, that, during the maximum phase of expansion, had reached the Tibesti's slopes, in the centre of Sahara. In the Northern portion it presented geological conditions very favorable for hydrocarbons and on it I had forecasted to develop our researches.

Searching for Platinum. Searching for Dunite

Desio worked in Ethiopia and in Albania for searching gold and platinum. In Ethiopia he concentrated his attention on a vast area which was limited by the hydrographical basins of the Bleu Nile and White Nile. There the rich minerals were part of the so called Dunite. Dunite is an intrusive igneous rock that dominantly consists of coarse grains of the pale green mineral olivine. When the rock weathers it typically appears in a dull yellowish brown colour often referred to as *dun*.

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Originally found in the *Dun Mountain* of New Zealand, was given its name in 1859 by the geologist Christian Gottlieb Hochstetter. The rock, which readily degrades into serpentine, is a particularly important commercial source of chromium, but may also contain copper, magnesium and platinum. Dunite typically occurs in sills or in horizontal sheets intruded between other rocks and may appear as dikes and laccoliths. It probably forms from the accumulation of dense crystallized grains of olivine that sink to the bottom of low silica magma.

In Ethiopia, in the mining district of Jubdo, the Dunite was weathered enough to release when washed, heavy minerals such as gold and platinum. In the same area he found a big accumulation of magnetite. During the exploration in the Gara Nadi region in 1938, his team was attacked by bandits and some escort soldiers were killed. Desio in this occasion had with him a steel tube to keep folded maps. One bullet hit the tube and his life was saved. Desio went to Albania in August 1940 to look for platinum and set a camp in Puka. He eventually found the Dunite rock similar to the one of Jubdo but no platinum in it.

A Life for the Science

Ardito Desio died on 12 December 2001 at the respectable age of 104 years. Two years before two American alpinists, John M. Climaco and Chris Breenere ascended a 5.700 m (18.700') peak along the Urdok Glacier which they named Mount Desio to honour his scientific and geographic activity.

He managed to produce a way of life and a school which he has passed to his pupils and to the Italian Academy. For this, we are very grateful to the Man and the Teacher. We like to recall him with his geological hammer sampling the mountains and trying to understand the essence of them.