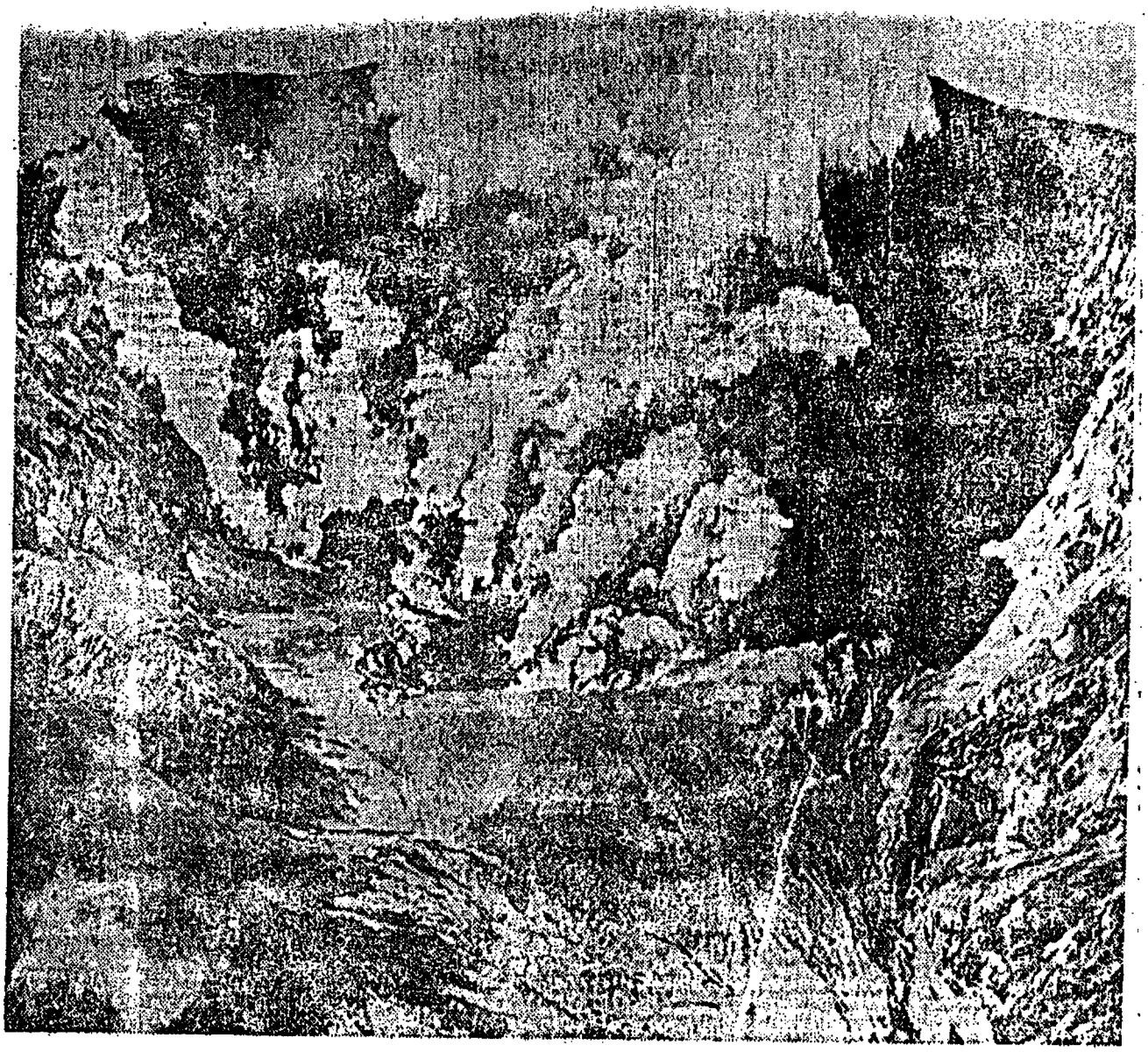

VOLCANIC ASH

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On

Volcanic Ash

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June 1980

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Amino Acids, Hydrocarbons, and Other Organic Compounds in Juvenile Volcanic Ash. N76-13666/2GA
Markhipin, Y.K. Podkletov, P.Y. and Zbruyeva, A.I.
Nov. 75, 8p. NASA-TT-F-16635
Tran-Transl. Into English from Dok.l Akad. Nauk Sssr(USSR), V. 222, No. 6, 1975 p. 1438-1440

An Atlas of Volcanic Ash
Heiken, G N74-25882
Smithsonian Contrib. Earth Sci., No. 12:1-106, 1974
Smithsonian Contrib Earth Sci. 1974
Volcanic ash samples collected from a variety of recent eruptions were characterized using petrography, chemical analyses, and scanning electron microscopy. Ash Morphology was related to magma compolition and eruption type. Ashes were either magmatic or hydrovolcanic (phreatomagmatic). The morphology of ash particles from magmatic eruptions of high-viscosity magma was governed primarily by vesicle density and shape. Ash particles from eruptions of low-viscosity magmas were mostly droplets. Droplet shape was in part controlled by surface tension, acceleration of the droplets leaving the vent, and air friction. Shapes ranged from perfect spheres to a variety of twisted, elongate droplets, with smooth, fluidal surfaces. The morphology of ash particles from hydrovolcanic eruptions was controlled by stresses within the chilled magma which result in fragmentation of the glass to form small blocky or pyramidal ash particles. (author abstract modified)

Balloon Measurements of Stratospheric Aerosol Size Distribution Following a Volcanic Dust Incursion. ADA018372
Miranda, H.A. and Dulchinos, J.
Aug. 1975 57p. AFCRL-TR-75-0518
Epsilon Labs Inc., Bedford, Mass.
Stratospheric aerosol size distribution measurements of the volcanic dust layer over Southeastern New Mexico, obtained on a balloon flight on January 21/22, 1975 several months following the Fuego volcanic eruption, are presented and discussed in preliminary fashion. Altitude profiles of all particles broken down into a set of contiguous size ranges indicate the presence of a pronounced concentration peak in the 16-21 Km region. Above this layer a distinct plateau is seen to exist between 22 and 26 Km which appears to be absent at night. This suggests the possibility of sunlight nucleation effects occurring in this altitude regime. A sunrise nucleation experiment conducted above this plateau region at 28 Km shows no evidence of nucleation during the first 1/2 hour following local sunrise. A distinct altitude-dependent size distribution slope in the 23-27 Km region which had been observed on a series of previous flight in May of 1973, appears to have been shifted to higher altitudes (26-28 Km)and is somewhat less pronounced.

Burden of Volcanic Dust and Nuclear Debris After Injection Into The Stratosphere At 40-58 Degrees N. ✱
Volz, F.E.
J. Geophys. Res., 80(18):2649-2652, June 20, 1975.

Volcanic dust and nuclear debris burdens in the stratosphere are analysed. Meridional profiles of turbidity after the explosion of the Katmal volcano in June 1912 at 58 deg north are compared with debris burdens from Chinese nuclear tests. Turbidity and burden generally peak strongly in artic latitudes. Only two tests show indications of a bulge at 30-45 deg north which probably existed from Katmal dust in the spring of 1913. The residence time of Katmal dust appears to have been about 1 year, whereas fallout of nuclear debris does not appear to have started before the winter following the tests. The results presented on turbidity and debris burden are compared with estimates of pollutants produced by supersonic transport aircraft since the latitude range of the heaviest traffic is 40-55 deg north. Models indicate increased pollutant concentrations of 70% in the heaviest traffic zone and 50% in the polar region. However, the results of the turbidity and debris analyses relate to generally lower altitudes than those of SST flights.

Calcium-Magnesium-Potassium Balance in Volcanic Ash Soil to Mazimize Vegatable Production.

Kamata Harumi (Agric. Res. Inst. Kanagawa Prefect., Japan)
JARQ 1979 13(1), 32-36 (Eng)
An experiment was conducted with soil derived from aeolian volcanic ash sediment amended with various amounts of $(MgCO3)4Mg(CH2)5H2O$, $K2SO4$ and $CaCO3$ to give 9 Ca:Mg:K ratios combined with 3 levels of total base saturation. (100, 80, and 60% of cation-exchange capacity). Maximum growth yeild, and nutrient uptake by spinach, lettuce, cabbage, sweet pepper, egg plant, carrot and turnip were obtained with a total base saturation of 80-100%. Antagonistic and promotive effects in nutrient uptake were recognized. In all treatments, base uptake by plants followed the order K Mg Ca. Based on the results, the optimum ration of Ca:Mg:K in volcanic ash soils was determined to be 60:25:15 and the optimum Ca-, Mg-, K- saturation was placed at 48,20 and 12% of cation-exchange capacity, resp.

Changes in the Global Energy Balance. A Report to the US Environmental Protection Agency (Final Report) PB 238 075

McLellan, A, IV
Wisconsin Univ., Madison, Center for Climatic Research, Environmental Protection Agency Contract 68-02-1308 EPA 650/2/74-116 Oct. 1974
The effect of aerosols on the earth's climate and the global energy balance was studied. There is much evidence that the earth's climate has undergone a wide variety of fluctuations. Over the past hundred millenia, as the earths surface temperature has decreased, volcanic dust in the atmosphere has increased (and vice versa). At least 40% of today's atmospheric particulate loading is due to man-made or man-accentuated sources. For the past 30 years, although the earth's annual mean temperatuer has been decreasing volcanic activity has not been increasing. Carbon dioxide and waste heat production have been increasing, but these processes tend to increase the global temperature rather than to reduce it. Man's production of particulates in the past 30 years has been increasing at a rapid rate. It is estimated that the loading rate of particulates from commerical jet aircraft into the stratosphere, where the residence time is much longer than in the troposphere, is almost half of that due to volcanic activity. Studies should be carried out to obtain better data from omoe meaningful estimates for the sources and sinks of atmospheric particulates.

Characterization of a soil Developed on volcanic ashes of the Ecuatorian mountain. *
De Olmedo, Juan L., Mejia, Luis (Cent. Edafol. Biol. Apl. Cuarto, Sevilla, Spain)
An. Edafol. Agrobiol. 1979, 38(1-2), 67-81 (Spain)
A soil from Pichincha provience, Ecuador is described by its morphol., chem., and mineralogy. At the surface, the soil is alk., then neutral, and becomes alk. again at depth. Chem. fertility is low. There is an abundance of well crystd. feldspar, hornbelende, hypersthene, and epidote. Volcanic glass decreases with depth. Allophane predominates with the clay minerals.

Clay Minerals of the Volcanic Ash Eropted From the Volcano USO In August, 1977
Kondo, Y., Kondo, R.
Tokyo, Nippon Dojohiryo Gakka
Nippon Dojo Hiryogaku Zassh. Journal of the Science of Soil and Manure, Japan, V. 49 (2), April 1978. P. 167-169

Distribution of Turbidity after the 1912 Katmai Eruption in Alaska.
AD-A012 786/0GA
Volz, F.E. 10 May 74, 7p Rept no. AFCRL-TR 75-0385
Availability: Pub. in Jnl. of Geophysical Research, v80 n18 p2643-2648, 20 Jun 75.

Air Force Cambridge Research Labs Hanscom AFB Mass

The spread and abatement of the aerosol injected into the stratosphere by the explosion of Katmai volcano in Alaska on June 6, 1912, have been investigated. The spread of the dust veil and twilight observations are discussed. Turbidity was determined from solar radiation data obrained mainly in central and northern Europe and the United States. In Europe, volcanic turbidity was quite large but highley variable during the summer of 1912 and became rather low in February 1913, when it was still high over the United States. Temporary presence of Katmai dust over Mexico City is very questionable, so that increased turbidity over Peru during 1913 may have had other causes. The turbidity disappeared rather suddenly in late 1914. Average residence time of the dust was nearly 1 year. (Author)

Effect of volcanic ash deposits on sockeye salmon lakes. *
Mathisen, Ole A., Poe, Patrick H. (Coll. Fish., University Washington, Seattle, WA 98195 USA)
Verh. - Int. Ver. Theor. Angew. Limnol. 1977 (Pub. 1978). 20(1), 165-72 (Eng)
The Effects on sockeye salmon (Oncorhynchus nerka) of a volcanic ash deposit in 1976 from Mt. St. Augustine volcano were studied. The mineral content of the ash and their distribution into the various lakes were detd. Phytopkankton/L was higher in 1976 as was the chlorophyll a content. The production of juvenile sockeye salmon did not differ from other postpeak years in the salmon cycle.

The enrichment of volatile elements in the atmosphere by volcanic activity; Augustine volcano 1976. *

Lepel, E. A. Stefansson, K. M.; Zoller, W. H. (Chem. Dep., University Maryland. College Park, Md

JGR, J. Geophys. Res. 1978 83(C12), 6213-20 (Eng)

Samples of atm. particulate material were collected in the plume of Augustine volcano in Feb., 1976 by using the high-vol. filtration system aboard the National Center for Atm. Research Lockheed Electra. The samples were analyzed for 38 elements by a combination of instrumental neutron activation anal. and at. absorption spectrometery. The results indicated that the volatile elements Zn, Cu, Au Pb, As, Cd, Cl, Br, Se, Sb, Hg, and S are enriched in the atm. samples in relation to bulk ash by factors ranging from 10 to several thousand. The enrichments compare closely with those obsd. for other volcanic emanations and for background aerosols in remote areas of the earth. Samples collected early in the eruption cycle had a much higher quantity of volatile elements in relation to ash than the later samples, indicating a substantial change in the emission of volatiles with time and eruptive cycle.

Environmental Pollution by an Active Volcano, Mt. ASO. Volcanic Ash and Its Outflow to the River *

Koyama, Keiko, Tsorota, Yoji, Sogimora, Keiji, Kawakami, Masahiro, Ueno, Kenich, Imamura, Osamo, Oeki, Homare, Miyamoto, Tomeki

PP. 33 1976

Trans in: (ASO Kazan Hoshutsubotso Ni Yoro Kankyo Osen Ni Tsuite--Kobairryo to Sono Kasen Eno Ryushutsuryo--)

Note: (Presented at the Environmental Proteciton and Pollution Prevention Lecture Meeting, 2nd, Tokyo, Japan, March 4, 1976.)

Languages: Japanese

CAS Registry No: 7782-50-5-77823-41-4 12033-49-7 1408-79-8

During the period of active volcanic eruption of Mt. ASO, the total volcanic ash fall and the insoluable and soluble components (chlorine, nitrogen trioxide, fluorine, SO4, with PH) were measured by the deposit gauage method at six locations 0.5-14. KM, from, the crater from Sept. to Dec. 1974. The amount of ash fall decreased proportionally with distance from the crater. The total ash fall in the entire area from Sept. to Dec. 1974 was estimated to be 1,200,000 + OR - 500,000 ton. Total ash fall in the entire period of volcanic activity is thus the Shirakawa River with rain, turning the river water muddy. Flourescence x-ray analysis of river water reflected the composition analysis of the volcanic ash. The amount of ash falling into the river up to June 1975 was estimated to be 300,000 T. (2 Refs)

Estimates of Climatic Changes Following Volcanic C Eruuptions from Tree Growth Record, AD-A026 166/9GA
Wilburn, John Bart, Jr. 1976, 15p

Army Electronic Proving Ground, Fort Huachuca, Ariz

The purpose of this project was to detect and estimate anomalous, annual precipitation during a period of 10 years following volcanic eruptions. In order to accomplish this, a record of precipitation was required whlich would span the time period covered by the volcanic record and yet would provide a resolution of 1 year. SInce the record of volcanic eruptions extends as far back as 1500 AD, the meteorological records available were clearly too short. For this reason, the records of tree growth were sought as a proxy record of climatic data. The requirement for linking this proxy record of tree ring data to climatic data is to build a regression model of precipitation based on tree ring data coincident with the available precipitation data. This regression model would then be used to estimate the precipitation during the years following volcanic eruptions. There has been a considerable amount of past work published showing that tree growth data can be a good record of past climates.

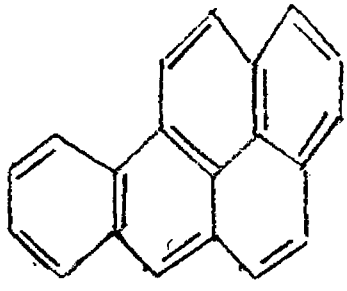
Geochemical Study of Arsenic in Rainwater *
Kurihara, Hideya; Shoda, Hiroko, Matsoda, Shunji
Gunmaken Kogyo Koyo Senmon Gakko Kenkyo Hokou (res. Rep. Gunma Tech. Coll.) (9): 15-27 1976
Trans In: (Kosoichi No Hiso No Chikyokagaku Teki Kenkyo).
Languages: Japanese
CAS Registry No: 7440-38-2 14808-79-8
Rainwater collected monthly during the period of January 1972 to December 1974 using 150 L capacity tanks in Maebaski, Kiryo, Akagi and Annaka, cities in Gunma prefecture, was analyzed for arsenic (AS), PH and Sulfate (S04) ion. Three cities are on a plain land, while Akagi is in amountain district. Values of AS content in rainwater were in range of 0.2-0.6 PPB, close to those in river water in Gunma. Amounts of as deposition had positive correlations with rainfall and S04 ion deposition, and a negative one with PH, through these correlations were not so appreciable in Kiryo. Amounts of as deposition were larger in the summer when rainfall was greater, and smaller in the winter when the rainfall was less. Differences due to the location were slight, and only the amounts of as deposition in Annaka and Kiryo and as content in rainwater in Annaka showed slightly greater differences. Volcanic ash thrown by the eruption of Mt. Asama in February 1973 greatly increased the amount of as deposition in dust in Annaka. (6 Refs).

Global Turbidity Studies. I. Volcanic Dust Effects - A Critical Survey, AD-736 686
D. Deirmendjian, Oct 71;. 74p Rept no. R-886-ARPA
Rand Corp, Santa Monica, California
Critical evaluation is given of the role of the volcanic dust introduced by three major eruptions - Krakatoa (1883), Katmai (1912), and Agung (1963) - in increasing atmoshpheric particulate turvidity. Typical turbidity anomalies, expressed as absolute increments in optical thickness in the middle of the visual spectrum, are found to be 0.55 for Krakatoa, o.35 for Katmai, and 0.25 for Agung. The last represents a fivefold increase of normal turbidity away from cities over a period of 2 to 3 years. No evidence of climatic effects directly related to the volcanic dust incursions is found. The possible contribution by the operation of 500 commerical supersonic transport vehicles to particulate turbidity is estimated to be small climatologically not significant. An initial "black cloud" experiment, consisting of a simple reduction by 10 to 20 percent of the incoming shortwave radiation, is suggested for use with numerical models of the general circulatin of the atmosphere to simulate volcanic dust effects. (Author)

The Influence of Volcanic Fluoride Emissions on Surrounding Vegetation. ✱
Garrec, J. P., Lounowski, A; Plebin, R. (Dep. Rech. Fondam., CEN, Grenoble, Fr.)
Fluoride 1977, 10(4), 152-6 (Eng).
The continuous emission of gasesous fluorides from active volcanoes in the vicinity of Mt. Etna, subjects the surrounding vegetation to uninterrupted fluoride pollution. INtermittent emission of F-rich ash, as from Soufriere, exposes the vegetation only temporarily, and the fluoride accumulated on the leaves is washed by rain

Shoao. Bulletin of Hokkaido Prefectural Agricultural Experiment Stations Hokkaido. Chod Nogyo Shikenjo. Mar 1978. (39) P. 54-65.

New Data on Volcanoes as Natural Sources of Carcinogenic Substances. ✱
Ilnitskii, A. P., Mishchenko, V. S., Shabad, L. M. (Cancer Res. Cent., Moscow, USSR)
Cancer Lett 1977, 3 (5-6), 277-30 (Eng) Ashes and laval from several



volcanoes contained from 0.3-0.4 to 5.4-6.1 ng benzo[a] pyrene (I) [50-32-8]/kg. I concns, in soil samples from 1.5, 2 nd 10 m depths collected near the Volchja River (a permafrost area) ere 1.47, 1.17-3.15 and 1.02-1.51ng/kg, resp. The concns. of I in volcanic ash and soil from permafrost regions apprently support the hypothesis of abiogenic I formation during a period of 12,000 vr or more.

A Reassessment of Atmospheric Pollution as a Cause of Long-Term Changes of Global Temperature. *
Mitchell, J. Murray, Jr.
In: The Changing Global Environment. S. Fred Singer (Ed.) Boston, Mass., D. Reidel Publishilng CO., 1975, P. 149-173. 43 Refs.
The Changing Global Environment 1975
The effects of atomspheric carbon dioxide and particuate matter on long term changes in global temperature are reviewed. The present atomspheric CO2 excess is estimated at 11% and is conservatively projected to increase to 15%. By 1980 and 32% by 2000 as a result of increased fossil fuel burning activities. Changes in the mean atompsheric temperature that amount to about 0.3 c/10% CO2 increase appear to account for only about one-third of the observed warming of the earth between 1880 and 1940; these changes, however, appear capable of contributing a further warming of about 0.6 C between the present time and the end of the century. The total global atomospheric loading by small particles is an estimated 40 million tons at present, with about 10 million tons being either directly or indirectly die to human activities. The impact of anthropogenic particle loading changes on mean temperature cannot be reliable determined from present information, although a cooling affect is likely. A cooling trend in the earth's temperature sine 1940 appears to be a natural phenomenon related to enhanced stratospheric loading by volcanic dust. Overall, the heating effect of CO2 appears to abe more influential than cooling effects due to anthropogenic activities. (Author abstracts modified).

Role of Volcanoes in the Formation of the Natural Level of Carcinogenic Substances *
Ilnitskii, A. P., Gvildys, V., Mishchenko, V. S., Shabad, L. M. (Onkol, Nauchn. Tsentr., Moscow, USSR).
Dokl. Akad. Nauk SSSR 1977, 234(3), 717-19 [Biochem.] Benzo[a]pyrene (I) [50-32-8] was measured by a spectral fluorescence method in volcanic ash and lava during an 1975-6 expedition to Kamchatka and Chukotak. The concns. found were in the range o.3 - 6.1 ng/kg. Presuming that similar concns. of I occur in ejecta of volcanoes elsewhere in the world, 1200 - 24,000 kg of I is released into the biosphere annually by the volcanic activity alone.

The Soluble Components in Volcanic Ashes from Mt. USU.
Tsuzuki, Toshibumi; Ito, Yasoo; Kotani, Reiko; Inoue, Katsuhiro (Hokkaido Inst. Public Health, Sapporo. Japan). *
Hokkaidoritsu Eisei Kenkyusho Ho 1978, (28), 101-2 (Japan).
The sol components in volcanic ashes formed by the 1977 eruption of Usu Volcano were analyzed. Distd. water (5.4 L) was added to the 600 g sample and this mixt. was vibrated for 12 h at room temp. After this treatment the insol. materials were filtered. The soln. had a pH 6.7-7.2 with Na 96, Fe 2.76, and F 0.026-ppm; Cd, Hg, and Pb were not detected.

SO2 Concentration and Volcanic Ashes Around Active Mt. ASO. *
Koide, Keiko, Yoji Tsorota, Keiji Sogimora, Kazonori Oeno, Mashahiro Kawakami, and Osamu Imamura
(Katsudoki Ni Okeru Asokazan Shuhen No SO2 Nodo to Kobairyo Ni Tsuite). Text in Japanese. Kumamota-Ken Eisel Kogai Kenkyusho-Ho (Annu. Rep. Kumamoto Prefect. Inst. Public Health Pollut.), Vol. 1974:38-42, 1974.
Kumamoto Ken Eisel Kogai Kenkyosho Ho Annu Rep Kumamoto Prefect 1974
The sulfure dioxide concentration and the quantity of dustfall in the area surrounding Mt. Aso Volcano during its active period were measured. In the extensive caldera of the multiple-mouthed active volcano there are several towns engaged in farming, touring, sericulture and stock raising. These towns have been victimized each time the volcano became active. The investigation was conducted during September through December of 1974 at six selected points using automatic analyzers to measure SO2 by the lead dioxide method and dustfall by the deposit gage method according to the 1974 Environmental Air Investiagation and Measuring Guidelines of te Environmental Agency. The SO2 at the tip of the mountain was 1.81 to 3.12 MG/LL SQ CM/Day, the same as at Yashiro City, which had one of the highest rates of the six selected locations. At the other five locations the SO2 concentration was the same as in unpolluted areas, due to the difference of 160-840 M height above sea level between the crater and the measuring points. Dust fall at the nearest point from the crater eas 64000 ton/SQ KM/Month; at the other five points there are maxima of 382, 144, 128 and 114 ton/SQ KM/Month, 15 to 900 times the values at the arao industrial areas of Kumamota Prefecture.

Stratospheric Aerosol Parameters for the Fuego Volcanic Incursion. *
Elterman, Louis
Appl. Opt., 14(6):1262-1263, June 1975. 5 Refs.
Appl Opt 1975
Searchlight probing results of volcanic dust over New Mexico resulting from the eruption of the Fuego volcano located in the Guatemala highlands are reported. A profile for the aerosol attentuation coefficient versus altitude is presented. Data reduction methods rule out any smoothing of field data at stratospheric altitudes between 11.7 and 26.3 KM. A turbidity chart for the same profile is also illustrated. During one night week over several hours of measurement, the major layer retained its altitude of maximum turbidity (about 16 KM) remarkably well. The other layers were less stable. On the following night, the major layer was found at a somewhat lower altitude (approximately 15 KM) but remained similar in appearance. A stratospheric dust increase of about 50% was observed compared with recent searchlight probing

Stratospheric Aerosol Particles and Their Optical Properties. *
Cadle, R. D. and G.W. Grams
Rev. Geophys. Space Physics, 13(4):474-501, Aug. 1975. 149 Refs.
Rev Geophys Space Physics 1975
The Tropospheric sources and effects of stratosopheric aerosol particles are reviewed. The particles consist largely of volcanic ash afor periods of possible a few months following major explosive volcanic eruptions, but at other times they consist largely of impure sulfuric acid which may be in the form of droplets or crystals. The sulfuric acid is formed largely by the oxidation and hydrations of sulfur dioxide, much of which in introduced into the stratosphere by volcanic eruptions. The mixing ratio of the particles, at least of the larger one in the 0.1 to 1 micro radium interval, is almost always greatest a few kilometers above the tropopause. Stratospheric particles by absorbing and scattering ragiation from the sun and earth can affect the atmosphere's rafiation balance thereby affecting the climate. Another major effect of the stratospheric aerosols is the denial of radiation to the region below the stratosphere. (Author abstract modified)

Studies on the Properties of Organic Matter in Buried Humic Horizon Derived form Volcanic Ash. III. Sugars in Hydroloysates of Buried Humic Horizon (Soil Polysaccharides). *
Yushida, M; Kumada, K.
Tokyo, Society of the Science of Soil and Manure, Japan.
Soil Science and Plant Nutrition. V. 25 (2), June 1979, P. 209-216.
To investigate the relation between age and the sugar compn. in hydrolysates of the surface horizon and buried humic horizons with age $\leq$ 28,000 yr. B.P., the neutral sugars and amino sugars in soil hydrolysates were detd. The ratios of total sugar C content to tatal C content of soil ranged from 2.68 to 4.13%. These values showed no distinct relation with age. Rhamnose [3615-41-6], fucose [2438-80-4], arabinose [147-81-9], xylose [58-86-6], mannose [3458-28-4], galactose [59-23-4], glucose [50-99-7], glucosamine [3416-24-8], [7535-00-4] were present in teh hydrolysates of all soil samples. The polysaccharides of soil samples which have been buried for shorter periods were dominated by glucose, whereas those of soil samples buried for longer periods were dominated by mannose. The proportion of hexoses showed a tendency to increase with age, whereas that of pentoses showed a tendency to decrease with age.

Studies on the Properties of Organic Matter in Buried Humic Horizon Derived from Volcanic Ash. IV. Characteristices of Polysaccharides in Hydrolysates of Fulvic Acid and in Ethanol Precipitates from Fulvic Acid in Buried Humic Horizon. *

Hexose and neutral sugars in hydrolyzates of fulvic acid fraction from buried humic horizons, extd. successively with 0.1N NaOH and 0.1M Na4P2O7, were detd. Hexose and uronic acid in in 75% EtOH ppts. from the fulvic acid were also detd. The proportion of mannose [3458-28-4] in hydrolyzates of fulvic acid extd. with NaOH showed a tendency to increase with age, but the proportion of galactose [59-23-4] decreased. The proportion of arabinose [147-81-9] and xylose [58-86-6] in hydrolyzates of the fulvic acid extd. with Na4P2O7 decreased with increasing age. Most of the constituent neutral monosaccharides of the polyysaccharide in fulvic acids of the 2 exts. wer hexoses. The uronic acid to hexose ratios of the 75% EtOH ppts. of the fulvic acid extd. with NaOH did not show large variation from 28,000 yr B.P. to the present. However, the values of 75% EtOH ppts. of fulvic acid extd. with Na4P2O7 increased with increasing age.

Sudden Increase of Stratospheric Aerosol Content After the Eruption of Fuego Volcano: Lidar Observations in Fukuoka.

Fojiwara, Motowo, Tosahikazo Itabe, and Motokazu Hirono

Rep. Ionos. Space Res. Jap., 29(1/2):74-78, 1975. 10 Refs.

Rep Ionos Space Res Jap 1975

The results of 5 MO of Lidar observations from Oct. 1974 to Feb. 1975 in Fukuoka are reported. An extrordinary intense scatterng was 1975 observed from a thin layer in the lower stratosphere over Fukuoka, from middle Nov. 1974, about a month after th eruption of Fuego volcano in GUatemala. Based on the volcanic dust hypothesis, the speed of meridional transport is estimated at 50 CM/Sec. Local rawinsonde data show an increase of 5 C in temperature around the layer at the same time. The maximum of the peak values of the non-rayleigh backscattering coefficient beta M occured in Dec., reaching some 10 times those of the pre-volcanic layer. The layer began to spread out toward the lower altitudes a month after its appearance, and to vary in structure significantly in association with the variation of temperature, persisting from the day of the first detection throughout late Feb. 1975. (Author abstract modified)

Volcanic Ash: Examples of Devitrification and Early Diagenesis. ✱
Wise, S.W. Jr; Weaver, F. M. (Dep Geol., Florida State University, Tallahassee, FL 3206 USA
Sacnning Electron Microsc. 1979, (1) 511-18 (Eng)
The ultramorphol. of 2 bentonites (digenetically altered volcanic ashes or tuffs) was examd. by SEM in order to det. features which may be indicative of their volcanic origins. Both bentonites exhibit fabrics inherited from their parent rocks. One sample displays a fine pattern of parallel columnules composed of authigenic opal-C and smectite. The columnules composed of authigenic opal-C and smectite. The columnules represent highly deformed glass shards of a welded tuff which has been strongly altered by disgenesis. THe other sample is replete with angular molds of fine pyroclastic fragment and represents an original accumulation of relatively undeformed volanic ash particles.

Volanic Ash Precipitation in the Kamachatka and Xylophagoos Insects
Khomentovskii, P.A.;
Moskva, NauKa.
Priroda, Aug 1979. (8) P. 115-116.

Volcanic Dust, Sunspots, and Temperature Trends. ✱

Schneider, Stephen H. and Clifford Mass
Science, 190 (4216):741-746, Nov. 1, 1975. 32 Refs.
Science 1975
The effect of volcanic dust and sunspot activity on the general patter of global surface temperature since 1600 ad was calculated using a simple climatic model. Volcanic dust veils are an external cause of climatic change primarily because they can screen out several percent of the direct solar beam, thereby preventing some of the solar energy from reaching the lower atmosphere. A relationship between increases in volcanic dust concentrations and effective decreases in the solar parameter is defined which is scaled proportional to the dust increase. The dust veil index complied from a combination of historical accounts and direct measurement of volcanic contributions to the stratospheric aerosol is used along with observations from Muna Loa Observatory in Hawaii.

Volcanoes and Carcinogens. ✱
Il'nitskii, A. P. ; Belmskii, G. A. Shabad, L. M. (Moscow, USSR).
Priroda (Moacour) 1976, (9) 124-6 (Russ).
The current levels of volcanic activity do not contribute significant amts. of polynuclear aromatic hyrocarbons, particularly benz(a) pyrene (I) [50-32-8] to the environment. The concn. of I in volcanic ash is 0.3-0.4 and the total discharge is estimated at 120kg/yr.

Volcanoes, Considered by A palaeoclimatologist. *

Schwarzbach, Martin

(Culkane, Vom Palaeuklimatologen Betrachtet). Text in German. Bonner Meteorol. Abhandl., No. 17:575-596, 1973. 93 Refs.

Bonner Meterorol Abhandl 1973

The relationship between volcanoes and climate are described. Climate influences the foramtion and activity of volcanoies. Volcanoes influence essentially the whole climate of the earth by emitting carbon dioxide and ash dust into the atmosphere. The influence of volcanic dust on the Albedo of ice is small.