mineral suite facilitates comparison with other recorded outcrops to the north. A number of provenance areas are suggested.

The significance of the find is discussed in the context of the Quaternary history of south-west England.

INTEGRATION, INTERROGATION AND VISUALISATION OF GEOLOGICAL DATA FROM EAST CORNWALL USING GEOGRAPHICAL INFORMATION SYSTEMS.

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Geographical Information Systems (GIS) allow the rapid and quantitative spatial analysis of geoscientific data, with the different data sets being treated as layers within the overall database. The database discussed is based around a high resolution stream sediment geochemical survey (>800 samples) of the part of Cornwall north and east of lines joining Newquay, Bodmin and Fowey. In addition there are layers based on published data such as mapped geology, topography and mineral occurrences.The presentation highlights incosistencies between the geochemistry and mapped geology, for example, the continuation of the Middle Devonian to the west of Liskeard. The use of GIS to aid in visualisation of geological data is demonstrated for a number of areas in east Cornwall.

Besides simple overlay it is possible using GIS to develop and test complex models integrating the data layers. As an example, the authors have modelled the occurrence of gold in south Devon and identified a number of geological factors governing gold occurrence, based on weights of evidence and logistical regression techniques. These weights can be used to produce maps that indicate the probability of gold occurrence in east Cornwall. While this modelling is governed on the limited information available in south Devon, it is also possible to inductively generate probabilities using external databases, for example geological controls on major gold deposits worldwide.

ABSTRACTS OF POSTER PRESENTATIONS

SOURCES OF SILVER IN THE EAST LOOE RIVER - NATURAL OR ANTHROPOGENIC?

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Both the East and West Looe Rivers have very high concentrations of silver in their lower reaches. Enhancement in silver in the West Looe river is caused by contamination from, and natural enrichment around, the disused lead mines at Herodsfoot. The source in the East Looe river is of comparable intensity but of enigmatic origin.

We have traced the silver back to the storm water outfall from Liskeard where sediment values are 25 ppm Ag, 200 ppm Cu and 500 ppm Pb. The poster will present mineralogical data from the outfall to discriminate between a natural vein source and an anthropogenic origin.

EXTENSIONAL COLLAPSE IN THE FOOTWALL REGION OF THE LIZARD OPHIOLITE, EASTERN MOUNTS BAY: A METAMORPHIC CORE-COMPLEX ANALOGUE?

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Detailed structural field-mapping along the Mounts Bay coastal-section has revealed a group of late-Variscan extensional structures which have, until recently, largely been overlooked by previous workers. Although the extensional style is variable and partitioned, it is likely that they represent broadly coeval deformation which is related to gravity collapse.

- Structures verge down the dip of pre-existing regional foliations.
- They are dominated by low-angle detachments or shear zones in which the sense of displacement is consistently directed top to the south-east, which show local cross-cutting relationships with ductile features.
- The low-angle detachments are associated with a suite of folds and domino faults which do not show overprinting relationships and hence suggest synchronous brittle and quasi-ductile behaviour causing strain hardening.
- The late ductile deformation is cut by granite sheets, making it pre-final emplacement in age.
- They are cut by moderate to steep post-orogenic normal-faults.
- Many stages of quartz and, more rarely, calcite veins are observed, indicating high pore-fluid pressure throughout orogenesis.

The features documented along the section form a distinct and continuous group which shows increasingly brittle deformation styles towards the south-east. There are also strong geometric similarities between these structures and soft-sediment slump and slide features, suggesting that in bulk rheological terms, the overthickened crust is acting as a viscous wedge spreading under the influence of gravity.

The extensional structures appear to systematically become more brittle away from the Tregonning-Godolphin Granite and towards the Lizard Ophiolite. Kinematic indicators suggest extensional collapse directed away from a ductile region, through a zone of ductile folds, shears and transposing cleavages, and into a region deforming through brittle faulting. The ductile structure in the northwest transposes all earlier structures, but as the extension becomes more brittle to the southeast, earlier compressional features are still preserved. The ductile-brittle transition appears to be analagous to the core, carapace and cover of core complex models. Early brittle extension estimates

are of the order of 10-15%, whilst the amount of ductile extension is unknown. Evaluation of dated mineral veins hosted by low-angle faults suggests a minimum age for extension in the late Stephanian. The zonation of deformation styles may be related to original variations in the amount of compressional thickening, or to up-warping associated with the rising Cornubian granites.

LATE PRECAMBRIAN (CADOMIAN) SHEAR ZONE TECTONICS WITHIN ICARTIAN GNEISSES OF THE CHANNEL ISLANDS.

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The Channel Islands of Guernsey and Sark are one of the few localities where the c.2000 Ma pre-Cadomian (Icartian) basement of the Armorican Massif can be examined. Icartian lithologies are represented by foliated augen granites (e.g. "the Icart Gneiss") and metasediments and amphibolites which record at least two phases of deformation and amphibolite to greenschist facies metamorphism. On Guernsey, the Icart granite gneiss displays a single, variably developed LS mylonitic fabric. Rare enclaves and bands of metasediment within the granite gneisses contain folds of an earlier gneissic banding (S1) which are axial planar to the dominant fabric (S2). S2 is upright, strikes N-S and the associated lineation mainly plunges gently to moderately south. Kinematic indicators demonstrate a component of dextral simple shear during D2. On Sark, an early gneissic banding within metasediments and amphibolites (S1) has been deformed into tight to isoclinal flat-lying folds during D2. Where S2 fabrics have formed, they are associated with an intense, sub-horizontal N-S lineation (L2). Shear bands demonstrate that D2 was associated with a component of top-to-the-south shear. $^{40}Ar/^{39}Ar$ mineral ages of *c.* 600 Ma have been obtained from early Cadomian, foliated quartz diorite intrusions which were deformed in the solid state during D2 on both Guernsey and Sark. This indicates that D2 represents regionally important reworking of Icartian units during the Cadomian Orogeny. The contrasting pattern of D2 fabrics is consistent with Sark representing a flat-lying shear zone to accommodate dextral shear on Guernsey with an overall southerly direction of tectonic transport. This can be related to *c.* N to S subduction at the northern margin of Gondwanaland during the late Precambrian.

ASPECTS OF LATE TRIASSIC - EARLY TRIASSIC STRATIGRAPHY IN SOUTH-WEST ENGLAND

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Sections of Late Triassic and Early Jurassic rocks in south-west England provide important standards for correlation; they also have implications for the interpretation of the palaeogeography of the region at that time, and for its subsequent structural history. The most westerly onshore occurrence of such deposits in southwest England is in the Selworthy outlier, near Minehead, west Somerset. The lithostratigraphy, biostratigraphy, dating and correlation of the sequence there has been re-examined in connection with the mapping of the Minehead (Sheet 278) district by the British Geological Survey. The youngest beds proved in the Lias Group at Selworthy are Late Hettangian *(angulata* Biozone) strata known at outcrop. A cored borehole proved *liasicus* Biozone beds (>10m) overlying the *planorbis* Biozone *(c.* 8m) which rests upon *c.* 6m of Pre-planorbis beds (basal Lias Group). The underlying Penarth Group comprises the Lilstock Formation (2.25m) resting on the Westbury Formation *(c.* 10.60m), which is thicker than previously recognised. Underlying beds include the Mercia Mudstone Group of which at least the upper 12m are with the overlying Penarth Group and basal Lias Group (Pre-planorbis Beds), of Late Triassic (Rhaetian) age.